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OBSTETRIC SURGERY A MODERN SCIENCE

ITS SCOPE AND LIMITATIONS*

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Last to share in the general advance in modern medical science has been obstetrics. While there remain unsolved problems in the pathology of pregnancy and parturition, a considerable gain has been made in reducing the mortality and morbidity of parturition from hemorrhage, septic infection and shock, and in securing a sound anatomic recovery for the mother, and this with a lessened risk for the child. The application of the principles of surgery to obstetrics has made this possible. The development of antisepsis and asepsis marked the beginning of a new era in general surgery. The application of antisepsis to the parturient woman resulted in deaths from poisoning by antiseptic agents. At this time abdominal surgery had a high mortality rate because antiseptic solutions were commonly introduced within the peritoneal cavity. When we learned to limit the application of antiseptics to the exterior of the body, to our hands, instruments and appliances, general surgery was vastly improved, abdominal surgery became possible, and obstetric science entered on a new era.

While puerperal septic infection became far less frequent at this time, a contracted pelvis still had terrors for the obstetrician, the immediate repair of lacerations was imperfectly carried out, and many pathologic conditions in the abdomen and pelvis complicating labor received no attention. Antiseptic and aseptic obstetrics, while enthusiastically received and practiced in hospitals, was not thoroughly done in private houses and, while a considerable improvement in mortality and morbidity in hospitals was obtained, a far less proportionate gain was made in private practice.

At this time we firmly believed that puerperal septic infection never arose except by actual contamination from without during labor. We had not sufficient experience in dealing with appendicitis, pyosalpinx and other intrapelvic and abdominal conditions to recognize the fact that a focus of infection might be present in the pelvis or abdomen of the patient before labor began. We also failed to recognize that bacteria in the vagina may make their way into the uterine cavity after labor, and that it is impossible to know how virulent these germs in their new surroundings may prove.

The development of modern obstetric surgery dates from the perfection of the classic cesarean section, when Saenger accurately closed the uterine muscle and peritoneal covering separately. The mortality and morbidity of the classic section immediately fell to a rate corresponding to that of other abdominal operations. Next came the observation that patients infected during labor became so through repeated examinations after the membranes had ruptured, conveying bacteria from the vagina into the uterine cavity. Especially dangerous are unsuccessful attempts at delivery, which bruise and lacerate the tissues and deposit bacteria on open surfaces. It was observed that, while the instruments themselves and the hands of the operator might be sterile originally, and that while an attempt might be made to sterilize the vagina, repeated manipulation and examination so injured the epithelium of the genital tract that infection almost certainly occurs. While, theoretically, it may be possible to sterilize the vulva and vagina, it is practically a difficult task. When the lesson was learned that internal examinations should be made as rarely as possible; that diagnosis during labor should be made by palpation and auscultation and pelvimetry, and that it is a matter of gravity and responsibility to attempt vaginal delivery during labor, patients were brought to section uninfected and the results of the operation materially improved.

There still remains a relic of bad practice in the fact that the attempt is sometimes made to deliver the unengaged head by forceps. While this may rarely be successful, it often fails, and the unsuccessful attempt frequently leaves the patient wounded and infected. It is difficult to eradicate from the mind of the general profession the belief that one need not wait for engagement and molding for the successful application of forceps; but, until this is abandoned, there will remain from this source a considerable maternal and fetal mortality and morbidity.

The modern conception of the genital tract at labor was for a time greatly confused by conflicting reports from bacteriologists concerning the condition of the vagina and cervix. There is abundant evidence that bacteria, morphologically identical with virulent bacteria, are present in the vagina during pregnancy and at the beginning of labor. Their virulence can only be determined by transplanting them on a favorable soil. Some streptococci under these circumstances become hemolytic or directly poisonous, and others show much less virulence. The attempt completely to sterilize the vagina during labor cannot be carried out with absolute accuracy, and repeated attempts may injure the patient and result in infection. These con-

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

ditions are of importance in considering the question of the immediate repair of lacerations. The lochial discharge from the apparently healthy uterus cannot be considered as absolutely sterile for, should it escape into the peritoneal cavity after cesarean section, infection may result. Should the lochia be retained in the uterus without drainage, infection may develop. Hence, when the genital tract has been invaded by the hand or instrument of the obstetrician, it is incumbent on him to see that the uterus drains freely during the puerperal period. This is old knowledge, but made reasonable and plain by modern research. Bacteriology has established no important facts concerning puerperal septic infection, but explains the phenomena previously observed by careful clinicians. When we remember that the genital tract must have drainage after labor, it is seen that any attempt at immediate repair, to be successful, must not interfere with this condition of primary importance. So immediate closure of the torn cervix, if improperly performed, may result in the retention of lochia and infection. And the same is true of the immediate repair of the pelvic floor and perineum.

For the mother, modern obstetric surgery aims to obviate the dangers of contracted pelvis and disproportion between mother and child; to deal successfully with foci of infection or pathologic conditions of the pelvis or abdomen complicating labor; to repair the lacerations in the genital tract produced by labor, and thus to restore the mother to a sound anatomic condition after parturition. While these results are certainly important, modern obstetric surgery does far more in the interest of the child. Delivery by abdominal section is the safest artificial method of delivery. Not only is the life of the child saved, but also injuries to the nervous system which may seriously jeopardize its health are avoided.

The anatomic scope of modern obstetric surgery embraces delivery through the cervix and vagina with or without enlargement of the bony pelvis. By symphyseotomy and pubiotomy the dimensions of the bony pelvis can be substantially increased. Modern obstetric surgery also enables the obstetrician to solve a complex problem when conditions arise which justify the prevention of further reproduction. While he will always be on his guard against those who try to persuade him to operate without good reason, in cases in which there is a history of repeated difficult and dangerous parturition, the parents having living children, and further parturition would be attended with unusual suffering and risk, and husband and wife request sterilization, it may properly be done. In the case of feebleminded and degenerate individuals, the consent of parents or guardian may justify the same procedure. When the mother is attacked by a disease which renders parturition exceedingly dangerous, the operation is justifiable. Here experience shows that to meet the demands of modern surgery, the operation may not only render the woman sterile but also remove the tubes and ovaries and the body of the uterus and also the appendix. The question of leaving one or both ovaries must be decided on the merits of each case, with reference to the age and the general condition of the patient. The surgeon is a true conservative, and when he invades the abdomen, for whatever reason, he aims to leave the patient in such a condition that future interference may not become necessary.

Modern obstetric surgery includes the small class of cases in which the anatomic conditions may render vaginal delivery possible, but the physiologic elements necessary for spontaneous parturition are absent and the suffering caused by uterine contraction may be more than the patient can safely bear. The term "physiologic incompetence" for labor has been suggested to describe this condition. In some of these cases the macroscopic or gross anatomy of the patient may be normal, but some condition of the uterine muscle may be present which renders efficient uterine contractions impossible and vaginal delivery dangerous. Elective cesarean section without labor is very successful in these cases, and may be repeated with success.

Do the results of modern obstetric surgery, as compared with the results obtained by spontaneous labor, justify its existence, or have we lost the art of obstetrics and substituted for it a surgical monstrosity?

The maternal mortality of labor is difficult to estimate outside of institutions. The natural desire to avoid injurious criticism frequently leads to an inaccurate report concerning the death of patients in the puerperal period. It is fair to state, however, that the maternal mortality of spontaneous labor is a fraction of 1 per cent. under ordinarily favorable conditions. The mortality of spontaneous labor for the child is the mortality of asphyxia and, while it is difficult to obtain exact statistics concerning this, it is not a negligible factor in considering the results of spontaneous labor. Under the general head of birth pressure, fetal mortality may result in spontaneous labor from visceral hemorrhage.

If we place in direct contrast with this the results obtained by the classic cesarean section, when mother and child are in good condition, it is not unusual to find a series of cases ranging from forty to sixty without maternal death. If larger series of cases are taken, a mortality of from 2 to 3 per cent. is stated. In my experience, in 151 cases of patients not septic and not toxic at the time of operation, the maternal mortality was 0.066 per cent.

As regards the fetal mortality in classic cesarean section in cases in which mother and child are in good condition, I may quote the statement made by the author of the most recent American textbook, that "cesarean section is the most certain method of delivering a living child which exists." My experience fully agrees with this statement.

It would be interesting to know whether an essential improvement has taken place in artificial delivery through the vagina by the development of modern obstetric surgery. This limits vaginal delivery by forceps to cases in which the head is well engaged, avoids attempts at vaginal delivery when contracted pelvis or disproportion exists and, after such delivery, disinfects and drains the uterus and repairs lacerations.

The statistics of the older methods of performing this operation give a maternal mortality of between 1 and 2 per cent. In my experience, forceps delivery followed by antiseptic drainage of the uterus and immediate repair of lacerations has given no maternal mortality or morbidity in sixty-eight private patients, while in hospital cases this procedure has had no direct mortality.

High maternal morbidity following the use of forceps is stated by Gans[1] from the Königsburg clinic as

1. Gans: Monatschr. f. Geburtsh. u. Gynäk., 1908, xxvii, No. 4.

21 per cent., and of these, 3.82 per cent. were cases of severe septic infection. In estimating the frequency of lacerations in forceps cases, episiotomy was required in 24.73 per cent., and of these patients 51.06 per cent. sustained lacerations during delivery. The perineum was considerably lacerated in 16.9 per cent. To avoid extensive lacerations of the cervix, it was necessary to incise the cervix in 5.65 per cent.

The fetal mortality following the use of forceps varies in proportion to the mode of application. In the so-called low forceps operations, the fetal mortality of the Sloan Maternity was approximately 10 per cent., in medium operations 19.2 per cent., and in high operations 38.5 per cent., an average of 14.5 per cent. In the Königsburg clinic the fetal mortality attending the use of forceps was 12.45 per cent. In this clinic the high application of forceps had a mortality of 33.33 per cent. for the children.

Gans made an effort to trace the subsequent history of children delivered by forceps. In seventy cases one had failed to develop normally, and birth pressure had unquestionably been the cause of retarded growth. Another child delivered by the easy application of forceps had an injury to the muscles at the back of the neck and head producing contraction. In four there was a history of convulsions, and these had been difficult deliveries without apparent injury at the time of birth, although two of the children had scars on the cranial bones caused by forceps. It is interesting to note that in Gans' cases, among the primiparas delivered by forceps, one third of them had not again become pregnant after several years. This indicates some injury to the genital tract which interfered with conception.

The fact that version and extraction is accompanied by a comparatively high mortality makes it difficult to compare this procedure with delivery by cesarean section if the interests of the child are to be taken into account. The same criticism applies to the induction of premature labor which is accompanied by a maternal mortality of approximately 1 per cent. and a high fetal morbidity and mortality.

The indiscriminate application of cesarean section as a last resort is not modern obstetric surgery, but is the old and familiar error which for so long a time prevented the development of modern obstetric science. In cases in which repeated attempts have been made at delivery, and infection has developed, if delivery is effected by abdominal section, it must be accompanied by the removal of the fallopian tubes and the body of the uterus. Should this be declined, craniotomy or some form of embryotomy is indicated. The decision to limit the classic cesarean section to proper cases is a modern decision and has resulted in great improvement. The indiscriminate application of delivery by cesarean section when the mother is suffering from some dangerous disease is an error of the past and not the best teaching of the present. In eclampsia, for many years, the rule was to deliver the patient immediately, and the violent and dangerous method known as forced labor was responsible for many deaths. The indiscriminate application of cesarean section to eclamptic cases has thus been shown to be an error, and the limitation of the operation to a very small percentage of cases is a modern advance.

When we consider the limitations of modern obstetric surgery, we come on a condition which is general throughout medicine at the present day. The development of laboratory work and the use of so-called instruments of precision has led to the neglect of clinical observation made by the senses only. We study the pulse more by a blood pressure apparatus than by the finger. We rely more on bacterial cultures for a knowledge of the general condition of the patient than our powers of observation — by vision and touch. In obstetrics we are too apt to rely on given measurements as indicating the choice of operation, rather than a thorough study of the individual case. Modern obstetric surgery should be limited carefully by a thorough knowledge of the natural phenomena of labor, by the practice of palpation and auscultation in all cases, and, above all, constant observation in diagnosticating the engagement of the presenting part. No more common or dangerous error is made in studying labor than to mistake the unnatural position of the head of excessive lateral obliquity for a normal engagement. What is described by some writers as presentation of a parietal bone is often mistaken for a vertex presentation and for engagement. If delay occurs in labor under these conditions, the forceps are applied improperly and unsuccessfully. Modern obstetric surgery should be carefully classified and limited by accurate physical examination of the patient, and the tendency to resort to abdominal section should be strictly kept within certain bounds.

In the treatment of patients infected during labor, the obstetrician may be tempted to resort to section when craniotomy should be performed and, if section is chosen, to leave behind the body of the septic uterus. A further error in these cases consists in dropping the septic stump and closing the abdomen without drainage. In cases suspected but not proved to be septic, when the woman is young and in fairly good condition, the effort may be made to save the uterus by packing and draining it with 10 per cent. iodoform gauze; but, when there is good reason to believe that septic infection is present, delivery by section should not be resorted to unless the operator is prepared to remove the tubes and body of the uterus and to leave the stump outside the peritoneal cavity.

In this paper I have abstained from discussing different methods of performing cesarean section. In the hands of competent obstetricians several methods are successful and, as the obstetrician acquires wider experience, he will choose his method in accordance with the needs of the individual case.

The most important and essential limitation in modern obstetric surgery is the choice of those persons who shall practice it. Modern obstetric surgery can best be done by obstetricians, and not by general surgeons or by gynecologists. The technical performance of delivery by abdominal section is in many cases comparatively simple, and the general surgeon and gynecologist are inclined to vary the monotony of their practice by short excursions into the field of obstetrics; but they lack the practical experience which is the basis of all sound judgment in deciding to perform an obstetric operation and in choosing the best method.

Modern obstetric surgery has been slow in development because human life has been cheap. Compensation has been willingly given for the removal of abdominal tumors with a reasonable certainty that they would not return. But the birth of a child is the beginning of trouble and expense for a considerable period of years, and the legal value of human life is its wage earning capacity. This is well exemplified in the experience of a young general practitioner who had been trained in modern methods of antisepsis. He was called to

attend the patient in her home and made every effort to secure a proper aseptic technic. The husband interrupted him in this, saying that this was an ordinary case of confinement and that he could not afford to have all this done for his wife. The enormous waste of human life going on at present has created a sudden and renewed interest in obstetrics, and the time is ripe for securing a permanent advance in this branch of medicine. The multiplication of hospitals throughout the country, the opening of maternity wards, and the better training of medical students will produce a certain number of obstetricians capable of properly performing modern obstetric surgical operations. To these men cases of complicated labor will come and will receive proper attention with a corresponding lessening in maternal and fetal mortality and morbidity and a decided increase in the working capacity, reproductive ability and general health of women.

250 South Twenty-First Street.

MEDDLESOME MIDWIFERY IN RENAISSANCE *

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CHICAGO

According to the Bureau of Census, in 1914 there died in the United States 10,518 women during childbirth. This figure represents the deaths in two thirds of the estimated population of the United States. On this basis we must admit that there are about 15,000 deaths from childbirth in this country every year. This number does not take into consideration the postponed mortality, as, for example, that from operations undertaken to correct the bad effects of childbirth, and that from conditions which are not readily ascribed to the fact of childbirth, such as endocardial disease, nephritis from puerperal infection, etc.; nor does it include those deaths in which the women are buried under another diagnosis, either ignorantly or intentionally. I feel that no exception will be taken to the statement that there die annually in the United States 20,000 mothers during childbirth. The mortality of the newborn children also is noteworthily high, although it is impossible to show by statistics how many children die every year from the immediate and remote effects of childbirth. Most of us, however, certainly those connected with hospitals, know that too many children are lost at birth, or from the late effects of either spontaneous or instrumental delivery.

Of great importance is the continued excessively high morbidity of both mothers and babies as the result of labor. One of the most striking facts of the modern hospital treatment of parturient women is the still high percentage of women who have moderate degrees of fever during the puerperium, in spite of most rigorous aseptic and antiseptic precautions. According to the report of the Census Bureau, 4,664 women died of sepsis in 1914, but it is impossible to even guess how many women suffered from puerperal infections and carry the marks of the disease. If we estimate the mortality of all cases of puerperal infection as 5 per cent., this would mean that there were about 100,000 infected puerperae in the United States in 1914. This estimate is, I am sure, too low. All the hospitals with which I have been connected for the last twenty-five years show varying percentages of puerperae with fever. At times as high as 15 per cent. has been reported. These women in the majority of instances are not very sick, the fever seldom goes above 102 F., and if it does it is not high long. The temperature is usually ascribed to other causes, but it is most often due to a mild pelvic infection with which the puerpera is well able to cope. But although the women recover, often quite promptly, the pelvic inflammation leaves permanent traces in the form of peritoneal adhesions or parametric thickenings, and later uterine displacements. This fact was emphasized by Emmett long ago, but it deserves repeating. The patient recovers and leaves the care of the obstetrician, but she comes back again for relief of distressing symptoms which he will find it hard to relieve. The procession of women passing through our dispensaries and private consulting rooms, repeating monotonously the statement, "Doctor, I have never been well since my baby was born," should draw our attention to the fact that things are not right in obstetric practice.

I have studied my case cards carefully and find that the majority of women who have borne children suffer from physical damage due to childbirth. As a cause of uterine disease, in my gynecologic practice, childbirth is much more frequent than gonorrhea. True, vesicovaginal and other fistulas and complete perineal lacerations are more seldom met, as compared with olden times, but minor degrees of laceration, prolapsus uteri, etc., are certainly no less frequent. If we were to judge from the prevalence of operations corrective of uterine displacements, we would have to say they are more frequent than formerly, but we are nowadays submitting more of these cases to operation.

As a producer of invalidism and semi-invalidism, the lacerated cervix is, in my opinion, more often culpable than a corresponding degree of perineal laceration. The patulous os allows the cervical mucous membrane frictional contact with the septic vagina; the open cervix permits the entrance of bacteria into the uterus; the diseased mucosa is a focus of infection, and even low grades of inflammation can produce bad aftereffects. The lymphatics, being loaded continually with bacteria and toxins, become inflamed, the connective tissue in the uterine ligaments soon takes part in the process. Parametritis postica is almost a constant attendant on chronic cervicitis. Backache, bearing down sensations, constipation, dysmenorrhea, semi-invalidism, are the symptoms of parametritis postica. Sooner or later, the infection travels upward along the lymphatics to the uterus, and chronic metritis results. Some authors call the enlarged, fibrous, heavy uterus simply myometropathia. I prefer the other term. Sturmdorff has most graphically described this condition and I agree fully with him that one of the most frequent causes of this disease is the lacerated cervix. I do not need to mention the other evil results of laceration of the cervix, but the tendency toward cancer, although discussable, should be borne in mind.

I feel sure that the accoucheur does not accord the cervix the dignity it deserves. Its mucous membrane is very delicate and easily torn; it is very sensitive to untoward influences, especially infection, and if the latter once obtains a foothold, the eradication of the same is almost impossible. The cervix is the center of the tendinous supports of the uterus. It may be likened to the hub of a wire wheel. The cervix is the protector

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

of the asepticity of the uterine cavity. Yet consider to what insults this organ is exposed. The steel divulsors which have a stretching force of 200 pounds or more; the tearing open by so-called manual dilatation; the cervical incisions; the gentlest of all, but still damaging colpeurynter.

Another structure whose physiologic and pathologic dignity is not adequately appreciated is the web of connective tissue supporting the uterus, the bladder and the rectum. While tons of literature have been written on the levator ani and pelvic floor, the importance of injury to this connective tissue supporting webbing has received scant notice. It may be torn or overstretched by the forces of labor or operative interference, or it may be thickened and distorted by inflammatory conditions, as was mentioned before.

Much more could be said along these lines, but sufficient has been brought out in this introductory manner to serve the purpose of certain generalizations I wish to make.

The methods nature employs to expel the child are best adapted to accomplish the purpose. They will produce the minimum amount of traumatism to the maternal soft parts, the least degrees of dislocation of the hollow pelvic organs, and will expose the child to the smallest amount of danger. The essence of these methods of nature is slow dilatation of the passages, and gradual, temperate advance of the child through them. This advance is accompanied by well-planned movements of adaptation and rotation of the child, the whole, when consummated naturally, being a beautiful mechanical accomplishment, and it usually results in only a small amount of damage to either mother or baby.

There is a notion, which both the public and the profession have entertained for many years, and which is becoming more prevalent among the profession of late, that natural labor should be curtailed as much as possible. This latter fact is partly explained by the agitation in the lay press for relief from the suffering of childbirth, and partly by the general operative furor which has gripped the profession. The old, time-tried, time-proved, and time-honored "watchful expectancy" in the conduct of labor has been replaced by a polypragmasia, pernicious in its effects, immediate and remote, and for both mother and child. Methods to shorten the time of labor have been multiplied and great virtues have been claimed for them. One writer brazenly advances as a virtue the saving of the obstetrician's time and sleep. Without doubt, protracted and painful labor does weaken the parturient and requires a longer convalescence, but there are no permanent effects. In natural labor a few hours more or less makes no difference in the immediate recovery. Study of the rapidity of the recovery of women after delivery will show that the main factor in producing slow convalescence is the injury inflicted by labor, or operative delivery. The amount of surgical trauma determines the smoothness of the recovery, even more than the stress of the nerves. The women recover from the latter after the first good sleep, but require much longer to recover from their wounds. From this point of view we must commend the use of anesthetics in the early stages of labor. They permit the parturient canal to be properly dilated. Unfortunately, some of them have the disadvantage of endangering the child and thus necessitating operative interference on its account. The number of injuries spared by the anesthetic is thus made up by the artificial deliveries.

I wish to call your attention to the most common of the evils which have gained foothold in obstetrics. First among the practices which should be condemned as meddlesomeness are attempts to cut short the period of dilatation of the cervix. As already explained, indeed, as every accoucheur knows, the only way to dilate the cervix safely is nature's way. Manual dilatation always tears the cervix. Colpeurynters often do so, and almost invariably, if traction is put on them, and in addition, they pull the cervix downward while the uterine action pulls it upward. Overstretching and dislocation of the cervix result, and gynecologic and urologic disease follows. Furthermore, danger of infection attends all these maneuvers, no matter how aseptically the operation is carried out. True, the women seldom die of sepsis, but the morbidity, immediate and postponed, is high.

Another form of interference is the indiscriminate use of twilight sleep, gas and oxygen and other anesthetics. I have to admit that I use anesthetics too often and too liberally. I know that as the direct result of my administration of morphin and scopolamin, of ether, gas, etc., I have increased the frequency of forceps operations, of lacerations, and of postpartum hemorrhage in my practice. In the dispensary service of the Chicago Lying-In Hospital postpartum hemorrhage is very rare, in my own practice it occurs much oftener. The same is true of the forceps operation. While I almost never deliver a woman without some form of anesthetic I am trying to reduce the amounts required to render the woman comfortable.

Another practice that should be eliminated is making the parturient bear down before the cervix is fully dilated and the head passed through it onto the pelvic floor. The dislocation of the cervix, the stretching of the paracervical tissues, is one of the potent causes of procidentia uteri. How much difference is there between pulling the cervix down with the obstetric forceps and forcing it down by powerful premature bearing down effort? Even after the head has come to rest on the pelvic floor it is wise to moderate the bearing down efforts. We should try to save the levator ani and the pelvic fasciae from too rapid distention and too brisk distraction from their attachments. The desire for rapid delivery should be curbed, unless danger threatens the mother or child, and the forces of nature should be restrained in the interests of the soft parts and the fetal brain. An extra half-hour spent by the accoucheur in this part of the delivery may save the woman from permanent relaxation of the pelvic floor, cystocele, rectocele, and possibly later operation. For this reason I cannot sympathize with the revival, made at the New York Lying-In Hospital, of the obstetric delivery chair. Slow, spontaneous delivery should be the object sought, not rapid delivery.

Too frequent vaginal examinations, "ironing out the perineum," must also be condemned. The danger of such manipulations is in the installation of mild infections which later lead to invalidism. Occasionally such a mild infection leads to fatal pulmonary embolism, and again a virulent sepsis results. For these reasons the rectal examination should be substituted for the vaginal in nearly all cases of labor. It is astonishing what may be accomplished by the rectal examination and it requires very little practice to acquire efficiency in it. I have conducted the majority of my cases by means of this method of exploration. Interns in the Lying-In Hospital often boast of the fact that they make hardly one vaginal examination in twenty

deliveries, and we have diagnosed face, brow, breech, occiput posterior presentation, prolapse of arm and cord, contracted pelvis, etc., in this simple, painless, harmless and rapid manner. I cannot urge too strongly this point.

Of all the meddling practices, giving pituitary extract is the most dangerous to mother and child. Sixteen cases of rupture of the uterus produced by pituitary extract are on record.[1] Dr. Stowe, my associate, knows of two. Others have been recounted to me, and I doubt not that many more have occurred and have never been reported. Hardly a month passes but what I learn of cases in which the baby has been lost in labor rendered pathologic by pituitary extract. I myself have observed the bad effects of pituitary extract on the child. Lacerations of the cervix and perineum are frequent results of the violently rapid delivery under the influence of the drug. I have used it a great deal. First I gave 15-minim doses. Now I give 3 drops and on special indication only. Recently I gave 3 drops to a woman weighing 180 pounds and the resulting contraction of the uterus was so powerful and prolonged that I had to put the patient asleep with ether. This contraction lasted more than five minutes and the fetal heart tones almost ceased. Pituitary extract should not be used except in the presence of a real, scientific indication, and it is governed by the same conditions as the forceps operation, that is, the head must be engaged, the cervix completely dilated, no mechanical disproportion between the child and maternal parts, etc.

The abuse of the obstetric forceps is an old charge against the profession, and, regrettable as it is, we must repeat it today. In the practice of some obstetricians the majority of deliveries are done by the forceps. Most often the indication is "bed time" or "office hours" or some other set appointment, such as an operation or golf. Often, too, the forceps are used to correct bad practice in the early conduct of labor, for example, the use of a colpeurynter, which has displaced the head, allowing the cord to prolapse, or abnormal rotation of the head; or administration of twilight sleep during which the child's life is endangered; or giving pituitary extract, which has resulted in tetanus uteri and threatened danger to the fetus from asphyxia; or permitting too early bearing down efforts, which have tired the woman out so that she has no strength left for the actual delivery.

Another form of meddlesomeness is the too frequent cesarean operation. In some communities it seems that the only method the obstetricians know of solving the knotty obstetric problems is to cut them. I believe some accoucheurs do not do enough cesarean sections. I know that hundreds of women are mutilated by forceps deliveries and their babies killed, and all this could be prevented by cesarean section. I believe the indication for section should be broadened in placenta praevia, in eclampsia, and in the anomalies of the mechanism of labor. Yet one is appalled when the flimsy indications for the frequent operation are discovered. The main reason is the ignorance of obstetrics; indeed, sometimes one must ask, with Holmes, Is obstetrics a lost art?

Even in the treatment of abortion there is too much meddling. It is usually possible to stop the bleeding and procure complete dilatation by tampon, and yet it has been recommended to cut the cervix in such cases, in order to empty the uterus. Hirst even believes we should not try to induce therapeutic abortion by the usual methods, but do vaginal cesarean section at once. Now it is still possible to empty the uterus in two stages, letting nature do most of the work, and it will be done with less permanent damage than by a cutting operation.

In conclusion, let me urge that we depart not too far from our trust in the natural forces of labor, that we still uphold the policy of "watchful expectancy" or, if you prefer, "armed expectancy," that we remember that the obstetrician's duty is not to make of labor a surgical operation, but to conduct it as a natural function, interfering only when called on by the necessity of preventing undue suffering, or saving fetal or maternal life.

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1. McNeile: Am. Jour. Obst., 1916, ii.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. DAVIS AND DE LEE

DR. CHARLES S. BACON, Chicago: I would emphasize what was said about the irregular contractions of the uterus simulating fibroid tumors because that is a point often overlooked. I have known serious mistakes to be made in this connection. I would also emphasize the importance of the exact diagnosis of the station of the child before undertaking the forceps operation because I believe that very often forceps are applied to the head still in the inlet with the idea that the head is engaged and that the operation is easy, when, as a matter of fact, we have a high forceps operation. Care in the external examination, as shown by Dr. Zinke, would show in every one of these cases the location or the station of the child. I would raise only one question in what I heard of the paper this morning, the value or even the propriety of packing the uterus after drainage, because I do not believe that packing drains; it has rather the opposite effect, that of increasing the danger of contamination. It prevents drainage rather than improves it. I would like to call attention to one operation that was omitted, and that is, opening the pelvic girdle in the cases of moderate contraction of the pelvis where, after the test of labor and after the time for the safe performance of cesarean section has passed we must choose between destroying the child or doing something that may save it and the mother. Especially in multiparas can hebosteotomy be performed. The advance in obstetric surgery, I think, can be shown by the disappearance in the last twenty years of the term, accouchment forcé, that dreaded operation which was the only thing to be done in cases of forced delivery before the opening of the cervix and the development of the methods for which we are indebted to Dührssen which have made possible the rapid opening of the uterus in the few cases where it is necessary. I would also call attention to the importance, in cases in which early emptying of the uterus is necessary, of hysterotomy as sometimes more conservative than dilatation and curettement.

DR. RUDOLPH WIESER HOLMES, Chicago: For a number of years there has been very little if any material improvement in the life expectancy of the unborn child: Körosi (1874) showed that 6.05 per cent. of the infants of Budapest died within fourteen days. Williams (1915) showed that in his clinic the mortality was 7.05 per cent. In one large clinic, in 1897 the stillbirths aggregated 3.65 per cent., while in 1913 the stillbirths had gone up to 4.82 per cent. in spite of the reputed beneficence of the cesarean operation. I am heartily in sympathy with Dr. Davis in many of his comments, but I cannot let the opportunity go by without a protest against the widespread, promiscuous performance of cesarean section. Just the other day I prevented a cesarean section on a woman, quadripara, with three living children, the first of which alone was at all difficult; the indication placed by the physician was that he "didn't want to tear her perineum." I was informed by a man in one of our Middle West towns that more cesarean babies were born than were ushered in

normally and this was not entirely a facetious remark. Cesarean section has been applied altogether too broadly, and the revulsion is surely coming within a brief period. I am convinced that most of the complications which have been placed as indications may be more scientifically treated along pure obstetric lines; in too many instances the application of the operation is an expression of the attendant's inability to handle the case along such lines, for the cesarean operation, unfortunately, is the most simple abdominal operation, technically, that we have. In the treatment of placenta praevia, I have often interjected the query to my students, How many men would do cesareans if they took all day, and the hystereurynter would accomplish delivery in twenty minutes? There would be few. I heartily agree with Dr. Davis that in general cesarean section is not the appropriate treatment for eclampsia; it is now nearly twenty years since Stroganoff began his defense of his eclamptic treatment—and has the lowest mortality of any authority in the world—it only shortly will mean that Stroganoff will come into his own, and receive the recognition which is his due, that delivery, per se, is not the treatment for eclampsia. Peterson has fostered this tendency to operative treatment by his paper on cesarean section for eclampsia, where he divides the sections performed before and after 1908 with a fetal mortality of 12 and 3 per cent., respectively; however, if no deaths be eliminated the mortality jumps to 40.9 and 15.5 per cent., respectively. Dr. Davis did not touch on the vulnerability of the uterine scar after cesarean section, with the probability of rupture in subsequent labor. I have investigated this matter and find that there is an exceedingly high danger of this appalling catastrophy occurring. In the instances in which I have been able to inspect the scars after cesarean sections I find that 16.6 per cent. were vulnerable; Harrar, in 50 cases, found 16 per cent.; Asa Davis, in 33 cases, found 18.1 per cent. had vulnerable scars or the scars had ruptured; v. Leuwen, in 117 cases, found the scar was thinned in 20, 17 per cent. This is a real danger and should be recognized that any woman who has had a cesarean section has about one chance in six of possibly having a uterine rupture.

DR. E. GUSTAV ZINKE, Cincinnati: To teach obstetrics is one thing; to practice it is another; to exercise good judgment in the management of cases is still another. It was Lawson Tait who first suggested cesarean section for placenta praevia. On his advice a few cesarean sections were performed, eight in all, before 1900; five of the mothers lived, and six of the children were saved. In 1901, I recommended the cesarean operation for placenta praevia on theoretical grounds alone. Not a man present was willing to support the stand I had taken. My views were roundly condemned. Today, the justification of cesarean section for placenta praevia, under certain circumstances, is admitted by all. Every case of placenta praevia is a surgical case. If carefully studied before labor the diagnosis of placenta praevia may frequently be made before hemorrhage appears. In the hospital, in the care of a good obstetric surgeon, a timely cesarean section will give more satisfactory results than any other method of delivery in these cases.

DR. JOHN OSBORN POLAK, Brooklyn: I believe with Dr. Davis that the success of obstetric surgery depends on (1) the diagnosis; (2) the training of the individual operator, and (3) the asepsis. Regarding rupture of the section scar in the uterus following cesarean section, the work done by Findlay recently, not yet published, has conclusively shown in the sixty-two collected cases that no rupture has taken place in the scar of a cesarean wound, except where there has been definite morbidity, infection of some kind. This shows us that every labor case should be studied as to its diagnosis, that every questionable case should be given a test of labor under aseptic management. Then when we have a complication and the woman has had the test of labor we are in position to do cesarean section, extraperitoneal, intraperitoneal or transperitoneal as the choice may be, and our mortality will be practically nil. This is not the result at present throughout the country in the indiscriminate use of this operation.

DR. A. J. RONGY, New York: I wish to emphasize the importance of doing a pubiotomy in cases in which cesarean section may not be performed on account of presupposed infection. In the hospital with which I am connected we have done thirty pubiotomies in women, the majority of whom have had two or three dead babies. The women had been attended by a general practitioner and when brought to the hospital, attempts at delivery with forceps had been made which presupposed infection. These women being very anxious for living babies pubiotomy was done; no mother was lost and but six children. By cesarean section the mortality would have been at least 30 per cent., and we would have lost probably eight or nine of the mothers. In placenta praevia also pubiotomy is a life-saving operation. Another important point is the ability to diagnose the size of the baby while in the uterus. This has an important bearing on the matter of induction of labor in the early part of the ninth month.

DR. E. P. DAVIS, Philadelphia: I did eight symphysectomies and then stopped because I did not like the operation. I am in hearty accord with Dr. Holmes in his desire to stop unnecessary cesarean sections and I certainly hope that he will succeed in this effort. Modern obstetric surgery has for a most important part the repair of injuries occurring at labor, and I consider no vaginal operation complete unless the surgeon gives attention to repair of cervix, pelvic floor and perineum. I have not seen intravaginal gauze drainage tend to infection, nor have I seen the uterus rupture after cesarean section. I have had a number of patients on whom I have done cesarean section go through a spontaneous labor. Once a cesarean section does not, in my experience, mean always a cesarean section. For placenta praevia the operation should be immediate, so soon as the diagnosis is made. I believe that injuries to the genital tract and appendages do cause neoplasms. I do not believe in unnecessarily shortening labor; I have no sympathy with the modern fad in that regard. It is the condition of the individual patient, and not the number of hours, or days, or the convenience of the obstetrician, that alone is to be considered. Two things operating against success in modern obstetric surgery are: (1) failure of the man who sees the case first to make a diagnosis; he does not practice palpation; he does not know engagement when it is there; thinks it is there when it is not, and he interferes improperly and sends his funeral to the hospital; (2) visceral disease complicating obstetric operations. Women do not die of hemorrhage and sepsis, but of changes in the liver and kidney, the result of prolonged toxemia.

DR. JOSEPH B. DELEE, Chicago: I wish to subscribe most heartily to the remarks of Dr. Davis. A point of great importance is that of rectal examination. It is too bad that we took so long to learn it. Prolapse of the cord, posterior occipital presentation, breech, face, brow, all I have diagnosed by rectal examination. Another point is that chloroform is not absolutely essential to the general practitioner. I have been a general practitioner, I am still practicing where the general practitioner practices, and I find that the husband can give the patient ether as well as chloroform. The only disadvantage is the increased size of the obstetric outfit occasioned by the ether can, and this is negligible.

Statistics of Industrial Accidents.—How largely the matter of industrial accidents enters into the cause of our social ills, I am not prepared to state definitely, but with a record of from 40,000 to 45,000 killed wage earners annually and with an additional 200,000 working days lost on account of nonfatal accidents among the rest of our working population, I make bold to opine that it constitutes one of the largest causes of poverty and consequent dependency. Translated into actual dollars and cents, taking the minimum of 40,000 killed at a value as producing members of society of $5,000 each, and $2 as an average wage of the nonfatally injured, we have the economic loss sustained to the nation as a whole on account of industrial accidents represented by the very munificent sum of $600,000,000 annually.—Carl M. Hansen.

OBSTETRICS AND GYNECOLOGY UNDER IDEAL CONDITIONS IN A GENERAL HOSPITAL*

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BROOKLYN

There is at the present time a remarkable spirit of unrest in medical centers and in medical organization throughout this country. We have but recently seen the curriculums leading to the degree of doctor of medicine expanded from an indefinite course covering two or three years to a scientific course of four and in some cases five years. Clinical and laboratory instruction have almost entirely superseded the old didactic methods, outpatient services are being highly organized and medical educators are discussing now the advisability of a compulsory fifth or hospital year.

These remarkable changes may be attributed to two factors: first, the ever increasing and exacting demands of science, and second, the pressure from the industrial world for greater and greater efficiency. The reflection of this demand for an increase of scientific precision and industrial efficiency is markedly shown in present-day hospital management. Hospital organization and management were, and are still in some places, regarded as political spoils. For this reason it has seemed to me that it may be of interest to you to hear of the organization of an obstetric-gynecologic service in a city hospital, under the direct control of the department of charities of the city of New York, which from its foundation is an attempt at better and higher things, both from the points of scientific work and industrial efficiency.

The Greenpoint Hospital is located in a densely populated and growing section, with a capacity of 200 beds, devoted to the care of acute cases. It is a modern hospital with modern equipment, made up of three departments, medicine, surgery and obstetric gynecology, each of which is under the direct and continuous charge of a chief; with well-equipped pathologic and Roentgen-ray laboratories, under the care of paid residents, and a trained resident in each of the three departments, six interns on a rotating service of two years, and fourth year medical students as clinical clerks.

The description of this service would perhaps better begin with the arrangement of our staff, which may be considered under three divisions, (1) visiting staff, (2) dispensary staff and (3) house staff.

The visiting staff consists of a gynecologist and obstetrician in chief, in direct charge of a fifty-bed service, twenty-five obstetric and twenty-five gynecologic beds. The service is continuous. There are two associate gynecologist-obstetricians, also on continuous service, alternating every four months, one being on the obstetric division while the other is on the gynecologic division.

The dispensary staff is intimately associated with the hospital, one of the associates serving directly on this staff. The dispensary staff is divided into two sections, each section taking three days a week, there being two men in each section.

The house staff consists of a resident, intern and clinical clerks (fourth year medical students), the resident being a well-equipped ex-intern who serves for an indeterminate period of time, receives a small remuneration, $480 a year, in addition to the experience he of necessity acquires. The intern is a part of the general hospital rotating service; he serves four months as gynecologic-obstetric intern and then passes to the next position.

The points about this service which I wish to emphasize are as follows:

1. A gynecologic-obstetric service of fifty beds under the supervision of one chief on continuous service.

2. A dispensary staff intimately associated with the hospital.

3. A house staff in charge of an experienced man who is not subject to a regularly recurring change.

The desirability, even the necessity, of these points in a modern hospital should be apparent. The old and in the past ever annoying question of interns is well cared for by having the service during the absence of the visiting under the supervision of a resident who is sufficiently trained to assume responsibility, and will as a rule serve at least a few years. This man comes to know the desires of his chief, and takes a more personal interest in his work, for he is not to change to another service in three, four or six months' time. The resident acts as senior to the rotating intern, assisting and guiding him in his work.

The dispensary staff, which is intimately associated with the hospital, is necessary for the mutual benefit of both the hospital and the dispensary. High-type men soon become restless under the old routine of dispensary work, but open up to them the occasional privilege of personally following a case through its entire hospital course and work which in the past was considered dull and routine becomes intensely interesting. Such a dispensary staff also serves as a continual check on the character of work done in the hospital, for these men, being capable of interpreting operative results, will call continuously to the attention of the chief the ultimate character of treatment being received by the patients.

A continuous service for the chief means a higher average standard of treatment for the patient, which is the primary factor to consider in regard to hospital efficiency. It means a wider opportunity for scientific endeavor and therefore a more satisfactory service from the standpoint of the chief.

Within the memory of many of us the obstetrics in most of the general hospitals was under the direct care of men in charge of medical service, who made no claim to special obstetric knowledge, and in fact at the present time it is notorious that the gynecology in many general hospitals is still being cared for by the general surgeon.

Much credit is due to commissioners John A. Kingsbury and Henry C. Wright, who were directly responsible for the staff arrangement of the hospital. They conceived the idea and decided on the advisability of the appointment of an advisory committee from the various departments of medicine consisting of six of Brooklyn's foremost men, whose duty it was to nominate three men whom they considered suitable to act as the three chiefs. The original advisory committee plus the three chiefs form an advisory board, who act in conjunction with the commissioner for the best interests of the hospital.

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

The general character and quality of the work done in each of the three departments are regularly inspected and reported on by the members of the advisory committee.

ABSTRACT OF DISCUSSION

DR. JOHN OSBORN POLAK, Brooklyn: This paper shows what may be accomplished by the combination of obstetrics and gynecology under one head. By combining these two departments the service rendered is improved and fundamental pathology in women becomes better understood, which entitles us to recognition even from the general surgeon. Dr. Holden has presented the organization in a city hospital, and in our organization at the Long Island College Hospital we have the same general plan of one head, controlling both departments, a resident and an intern staff. From my experience of twenty odd years, hospital obstetrics cannot be well done without the assistance of trained help. The intern after two or three months of obstetrics does more harm and as bad work as the ordinary practitioner. With the resident system well developed one can keep his men for from two to five years and give them sufficient work to train them. These men gradually supersede the assistant visiting staff. The routine work is taken off of the shoulders of the attending physician, yet the responsibility is placed with him because he has to check up everything that is done. These men go from these institutions and develop better obstetrics and better gynecology in other places. It has been a most illuminating experience to see what the proper development of residents in obstetrics and gynecology will do for a service. We had a service for nearly twenty years which did not run above 300 cases a year. Since the introduction of the resident system some six years ago the cases have increased from 300 to 1,500 a year. Under this system these residents work in the dispensary, follow the case to the hospital and have operative privileges under the direction of the chief.

DR. CHARLES S. BACON, Chicago: It is interesting to observe how rapidly patients are going to the hospital for confinement. In several of the large city hospitals from one eighth to one fourth of all the beds are taken by obstetric patients. In the description of the hospital given by Dr. Holden two things seem to be lacking. One is an arrangement for teaching students. That the hospital should not be made use of for medical students is a great pity. They could obtain so much benefit and be of so much use to the hospital. Another thing which is lacking is provision for research work. The laboratory in such a hospital ought to be under the control of the obstetrician and his resident and there should be ample provision for laboratory work.

DR. HENRY P. NEWMAN, San Diego, Calif.: We should congratulate students who are privileged to profit by such instruction, but it must be recognized that, in order to fit one for the practice of obstetrics as a specialty, and the same is true of gynecology, requires, as a paramount essential, a much wider experience, a more thorough working knowledge of the intricacies of complicated cases, and a more intimate understanding of the individual patient than can be obtained in the class room or from textbook formulas.

DR. FREDERICK C. HOLDEN, Brooklyn: We have senior medical students who act as clinical clerks. They come in groups of six for three months, one month in each of the three departments. The second floor of the laboratory building has five large rooms used for pathologic work and animal experimentation. We have a paid resident pathologist and his work is supervised by an attending pathologist. There is also a large clinical laboratory on the fourth floor of the hospital where urine, blood, etc., are examined. We secured necropsies in 50 per cent. of our fatal cases. The building and equipment cost approximately $900,000.

Loss of Life in War.—The human loss sustained by a military power in a war may be caused by the weapons of the enemy, by disease and pestilence, privation, and hardship, physical exhaustion, capture and imprisonment by the hostile nation, and finally, by desertion.—Bodart.

ANESTHESIA IN HUMAN BEINGS BY INTRAVENOUS INJECTION OF MAGNESIUM SULPHATE *

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In this preliminary communication we wish to report briefly the course of anesthesia in three operations performed on human beings exclusively under the influence of an intravenous injection of magnesium sulphate. The object of this report is, at least for the present, essentially a theoretical one. These few observations, although far from being sufficient to demonstrate the practicability of this method of anesthesia, are completely sufficient to establish the theoretical question regarding the nature of the anesthesia produced by magnesium sulphate. Furthermore, the theoretical information thus obtained is an indispensable step in the development of the practical application of this method. In order to understand the question under discussion, a brief historical statement of the various phases in the progress of this investigation is necessary.

In a series of experiments on the effects of intracerebral injections of solutions of various salts carried on some eighteen years ago on rabbits by one of us, it was observed that an intracerebral injection of 2 drops of a 5 per cent. solution of magnesium sulphate produced complete anesthesia and relaxation of the animal lasting several hours. On the basis of the hypothesis that magnesium is an inhibitory factor in the life phenomena, this observation led to a prolonged experimental study of the effects of magnesium salts on the animal body and to many publications on this subject. In their first publication in 1905, Meltzer and Auer made the general statement that the salts of magnesium are capable of depressing the entire nervous system, and assumed in particular that these salts are also capable of producing anesthetic and other central effects. Since this first publication, quite an extensive literature grew up on the subject. Some of the writers insisted that magnesium exerts only a curare-like action, that is, the salts paralyze the motor nerve endings to such a degree that the animal is incapable of responding to any stimulation; in other words, that the animal which appears to be anesthetized is actually conscious during the operation and feels all the pain inflicted on it, but is incapable of manifesting its sensations on account of the complete paralysis. Against this assumption it is to be mentioned that in the course of their experimentation on animals, Meltzer and Auer found, among others, that a combination of ether inhalation and intramuscular injections of magnesium salts, in small ineffective doses, produces a profound anesthesia. Peck and Meltzer found this to hold true also for human beings. Since the amount of ether used in these cases was absolutely insufficient to produce anesthesia, the additional effect of magnesium is apparently of central origin. While thus these observations made the assumption of the central action of magnesium highly probable, it could not be claimed that it has definitely proved it for reasons which cannot be discussed here in detail. Studies of Auer and Meltzer on the effect

* From the Roosevelt Hospital and the Rockefeller Institute.

of intravenous injection of magnesium sulphate on the various stages of the action of the center of deglutition seemed to prove definitely that magnesium affects the center of the deglutition. While these observations seem indeed to prove definitely the central nature of the action of magnesium salts, it could still be assumed that the fact that magnesium salts affect some parts of the central nervous system cannot serve as evidence that these salts affect also the sensation of pain and the consciousness.

Evidently a reliable proof for the assumption that magnesium is capable of abolishing consciousness can be obtained only from observations on human beings. Intravenous injections of magnesium sulphate into human beings were made about a year ago in several cases of tetanus. Whether or not the consciousness of the patients was affected could not be learned from the meager descriptions of these cases. At any rate, these cases have the merit of the demonstration that certain amounts of magnesium sulphate can be given intravenously to human beings without endangering their life. Furthermore, in two or three of the cases the amount injected was surely not too small. In a recent series of experiments on intravenous injections of magnesium sulphate into dogs, Auer and Meltzer studied the quantity of magnesium which may be introduced without danger to the animal, and which would, at the same time, be capable of producing apparently profound anesthesia.

From the recent extensive experience on the use of magnesium sulphate in cases of tetanus, we gained the general impression that human beings are more susceptible to the effects of magnesium salts than animals. In trying to study the anesthetic effect on human beings of magnesium sulphate, administered intravenously, it was therefore necessary that the observations should be made with great caution, beginning with injections of only small doses. The dose of magnesium sulphate used in our first case was much smaller than some of the doses used for many hours with apparent impunity by Straub in his tetanus cases. We may add, further, that in our studies the patient was provided with two reliable safeguards against the prominent toxic effect of an overdose of magnesium salts (that is, respiratory paralysis): we had in readiness an apparatus for administering efficient artificial respiration, and had on hand a proper solution of calcium chlorid to use as a prompt antidote for the restoration of respiration.

OPERATIONS

The patients were prepared for the operations in the usual way, except that they did not receive the usual preliminary injection of morphin. In all three cases the cubital vein was exposed and a transfusion needle inserted directly into it. This preliminary slight operative procedure was done under local anesthesia. The magnesium solution was run into the vein through the transfusion needle from a graduated buret arranged on the principle of Mariotte's flask. The number of bubbles appearing in a unit of time at the lower end of the inner tube permits a general estimation of the rapidity of the infusion. This, however, was more reliably controlled by frequent reading of the quantity of magnesium which escaped from the buret in one or two minutes at a time.

Case 1.—March 30, 1916, G. F., Italian, weighing about 160 pounds, was operated on for glandular abscess in the neck. A 6 per cent. solution of magnesium sulphate was used in this case. The infusion began at 4:29 and was finished at 5:14 p. m. Altogether 180 c.c. of the solution were infused in forty-five minutes, 80 c.c. of which, however, were infused in the course of the last eleven minutes, which means at an average of 8 c.c. per minute. Shortly after the infusion was started, the patient began to complain of feeling hot; his face became very much flushed, and his forehead was covered with beads of perspiration; there was no nausea. At 4:45 the pulse was 104, and respiration 28 per minute. At 4:56 the pulse was 120, respiration 32. At 4:59, pulse 100, respiration 36. At 5:04, pulse 100, respiration 28. At 5:07, pulse 112, respiration 28. At the end of the infusion, pulse 112, respiration 20.

The operation was began at 5 p. m. The patient was fully conscious, but sensation was considerably diminished. He made no attempt to interfere with the operation. During the last seven minutes of the operation, the patient showed no indication of feeling pain, and manifested only slight signs of consciousness. The lid reflex was prompt. He remained very drowsy for about fifteen minutes after the operation. He responded slightly to loud calling. He said that he felt weak.

Twenty minutes after the operation the patient was fully awake. He said that he felt a "little bit of pain" during the operation. He was very thirsty, and had a glass of ice water. He had no nausea. There were no after-effects of the anesthesia, and the patient made an uneventful recovery.

During the last part of the operation the patient was practically under complete anesthesia and had evidently no knowledge of what was happening to him. His later statement that he felt a "little bit of pain" referred to the first incision. Respiration and lid reflexes remained practically unaffected. While there was later some muscular weakness which may have had its origin in the action of the magnesium on the endings of the motor nerves, this peripheral action was evidently far behind the inhibitory action which the infusion of the magnesium solution exerted on pain sensation and consciousness. At any rate, even this case clearly demonstrated that the magnesium solution exerts a genuine central effect which is entirely independent of any peripheral action which may or may not be present.

Considering the weight of the patient, it must be emphatically stated that he received a very small dose of the salt, a dose which would be absolutely insufficient to produce a similar effect on an animal. A dog of 10 kg. (one eighth of the patient's weight) which would receive 23 c.c. of the same solution (about one eighth of the solution given to the patient) in the course of forty-five minutes would hardly show any depressive effects.

Case 2.—May 2, 1916, A. S., weighing 120 pounds, was operated on for varicocele. The infusion of a 6 per cent. solution of magnesium sulphate was begun at 4:20 p. m., and terminated at 5:08 p. m. In forty-eight minutes, 394 c.c. were infused. The average of velocity of infusion was 8.5 c.c. a minute. From 4:46 to 5:05, however, 235 c.c. were infused, which is at an average of 12.4 c.c. a minute. Furthermore, in the one minute from 5:04 to 5:05, the large quantity of 39 c.c. was infused. In the following last three minutes altogether only 13 c.c. were infused. This patient also complained of heat, and his face became flushed and the forehead was covered with perspiration. The patient vomited at 4:46. During the entire infusion the lowest pulse rate was 108 a minute. At 4:58 the patient began to feel sleepy. The first incision was made at 5:00 p. m. At 5:02 the patient was still moving and slightly groaning, but did not interfere with the operative procedure. Anesthesia soon became very deep. At 5:06 respiration was shallow and only 6 per minute. The rate of infusion of magnesium was greatly reduced; respiration immediately became deeper and more frequent, about 22 per minute. At 5:08 the magnesium infusion was stopped completely. The operation was completed at 5:13. In the

last five minutes of the operation the patient had no infusion of magnesium solution. At 5:15, 10 c.c. of a 2.5 per cent. calcium chlorid solution were infused. There was no need for it, as the respiration was fairly good, but the injection of the calcium solution deepened the respiration visibly. At 5:19 the patient answered questions. He opened his eyes at 5:20 and was apparently fully awake. He stated that he felt no pain whatsoever during the operation. He was very thirsty, and had two glasses of ice water. No nausea or vomiting followed. There was no special after-effect from the magnesium infusion. He passed urine spontaneously and freely which was free from albumin, casts, sugar, acetone and diacetic acid. Twenty-four hours after the operation the patient began to complain of pain in the wound. The temperature rose gradually to 103 F. Pain and high temperature soon disappeared, however, and the patient made an uneventful recovery.

In this case consciousness and sensation were completely abolished for at least ten minutes. The patient had no recollection whatsoever of the operative procedure. The short but very rapid infusion of the solution at a rate of 39 c.c. in one minute affected considerably the rate and depth of the respirations, but a reduction in the rate of the infusion caused quickly a return of the respiration to practically normal conditions.

CASE 3.—May 26, 1916, H. P., weighing 125 pounds, was operated on for double inguinal hernia. The magnesium sulphate was given in this case in a 10 per cent. solution. Infusion was begun at 4:23 and finished at 5:14; 280 c.c. were infused in the course of fifty-one minutes, that is, at an average of 5.4 c.c. per minute. However, between 4:39 and 4:52, that is, in thirteen minutes, 169 c.c. were infused, which is at an average of 13 c.c. per minute. Between 4:52 and 5 o'clock the infusion was stopped. From 5, when the infusion was resumed again, to 5:14, when it was finally stopped, only 20 c.c. were infused, that is, at an average of about 1.5 c.c. per minute. After about 30 c.c. were infused, the patient began to feel hot, was perspiring and became restless. When about 63 c.c. were infused, the patient stated that he felt weak. At 4:25 (15 c.c.), the pulse was 120, and respiration 22 per minute. At 4:33 (57 c.c.), pulse 120, respiration 16. At 4:45 (143 c.c.), pulse 96, respiration 24; the operation was started. At 4:47 (182 c.c.) *the anesthesia was very deep; there was no spontaneous respiration; artificial respiration by pharyngeal insufflation was begun.* At 4:50 the pulse was small, 96; the patient pale and slightly cyanotic; the pupils slightly dilated and fixed. At 4:52 the magnesium was stopped. From 4:47 to 4:56, for nine minutes, there was no sign of a spontaneous respiration. At 4:56 occasional spontaneous respirations appeared. At 4:58 spontaneous respirations were regular, 20 a minute; the pulse was 90 a minute and bounding. At 5 o'clock the patient's color was good, respiration regular, pulse 120. Magnesium was started again. At 5:03 the lid reflex was still absent; pulse 112, respiration 22. At 5:06 the lid reflex was coming back. At 5:08 the pulse was 118, respiration 20. At 5:10, pulse 100, respiration 22. At 5:13, pulse 96, respiration 26. At 5:14 magnesium infusion was stopped. At 5:21 the operation was finished; the pulse was 108, respiration 27. At 5:31 the patient opened his eyes when spoken to.

He was conscious on return to the ward, very thirsty, and was given 6 ounces of water in ten minutes. There were no nausea and no vomiting. *The patient asked whether he had already been operated on.*

On the second day after operation the patient complained of abdominal pains; the abdomen was moderately distended and rigid. The temperature rose to 102.4 F. The patient was about normal again on the third day, and recovery was uneventful.

In the two days following the operation the urine showed a trace of albumin and many hyaline casts, but no sugar.

During the infusion of the magnesium solution the patient was completely unconscious for about forty minutes; when he came out of the anesthesia he had no recollection of the events of the operation. For at least ten minutes there was no spontaneous respiration; the respiratory function was then maintained exclusively by artificial respiration (pharyngeal insufflation). Under the magnesium anesthesia the lid reflex was absent for about twenty minutes. For a few minutes the pulse became slow, and for from ten to fifteen seconds it was even irregular and at times imperceptible. It is possible that with the concentration used in this case (10 per cent.) the magnesium solution may exert also a cardiac effect. This concentration, therefore, ought not to be used until we have learned more of the effects of magnesium sulphate on human beings when used intravenously.

SUMMARY

The observations made in these cases prove conclusively that the state of anesthesia which is produced by injection of magnesium sulphate is actually anesthesia, that is, in this state sensation as well as consciousness are temporarily more or less completely abolished. This central effect may or may not be accompanied by a pronounced paralysis of the endings of the motor nerves of a great part of all skeletal muscles. Evidently, the central effect, especially the effect on the sensation of pain and on consciousness, can be attained with a smaller dose of the magnesium salt than that which is required for a paralysis of the motor nerve endings. The central effect also appears to set in sooner than the peripheral one.

The employment of intravenous injection of magnesium salt as an anesthetic may prove to be indeed a practicable and advantageous method, because, in the first place, it may cause simultaneously a moderate degree of relaxation of the muscular mechanism, and, secondly, because the untoward effects can be rapidly reversed by a careful administration of a solution of calcium chlorid. This method, however, before it can be made practically serviceable, will require a good deal of careful study. We shall, therefore, at least for the present, abstain from a discussion of the possibility of the practical applicability of this method.

Venereal Diseases and Militarism.—Venereal disease is the cause of more hospital admissions among soldiers than any other disease or group of related diseases. It caused 31.8 per cent. of the total military inefficiency in the British army in 1910. It was the cause of one fifth of all the British military hospital admissions for that year, yet it caused but one one-hundredth of the total military deaths. It causes one third of all the illness of the British navy, both at home and abroad. In 1910 the navy force included 113,530 men, of whom nearly 15,000 were ill of venereal diseases. From 1865 to 1872 the hospital admissions of soldiers in the United Kingdom for venereal diseases averaged more than one case to every five men, in some years four men, in the army. In the fourteen years ending 1883, the average admission rate for the whole British army in India for venereal disease was 225 cases per 1,000 men. In 1895 these admissions reached the enormous proportion of 537 per 1,000 men. I hasten to add that this frightful condition has been greatly ameliorated. In 1900 there were but 295 cases per 1,000 men. But even this is nearly one for every three men! In very recent years the figures for the British army have been notably lowered. In 1908, for example, the lowest figures on record up to that time were reached. These were 76.8 hospital admissions per 1,000 men of total strength of the troops in the United Kingdom and Europe. *From 1903 to 1907 the average admissions were 122.3 per 1,000 men of the whole army.—V. L. Kellogg.

THE SIGNIFICANCE OF PULSE FORM *

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The study of the pulse has occupied the attention of physicians from the very earliest times, and the pulse remains today one of the most accessible and important indications of the general condition of a patient. In studying the pulse the following data are noted: its rate, its rhythm, its tension, its size and its form. More precise knowledge concerning each of these is accumulating. The pulse rate, being an index of the heart rate, is of the greatest importance. In

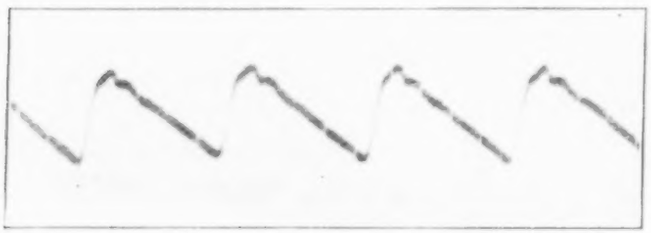

Fig. 1.—Sustained pulse of extreme type. Hypertension. Rate, 54.

certain arrhythmias, the heart rate differs from the pulse rate because some ventricular contractions produce no palpable pulse beats at the wrist. This pulse deficit derives great significance from the fact that it indicates the amount of energy uselessly expended by the heart. Disturbances in the rhythm of the pulse have been carefully studied in recent years both by mechanical and by electrical methods. These studies have enabled us to classify the cardiac irregularities, to define their clinical significance, and to direct our therapy with greater precision than was formerly possible. Changes in the tension of the pulse are now recorded in terms of systolic and diastolic pressure, and the practical gain resulting from such records need not be emphasized.

Our knowledge of the size and form of the pulse has not kept pace with the advances in our knowledge of other pulse factors; and yet every physician, consciously or unconsciously, bases his opinion as to the quality of the pulse very largely on alterations in its size and form. For several years we have made records of the size and form of the pulse, and it is hoped that a presentation of some of our observations and impressions may be of service in the interpretation of observations that are made at the bedside.

The size of the pulse has been determined by measuring the volume of the waves recorded from a plethysmograph that encloses the hand, the forearm and the lower arm. The size thus determined usually varies from 0.4 to 1 c.c. An unusually large volume pulse usually occurs in aortic insufficiency (from 1.4 to 2 c.c.). In a given individual the size of the pulse is greatly affected by conditions of chilliness and warmth. When a person is chilly the pulse becomes smaller, whereas when he is warm it becomes larger. Variations in size from 0.26 to 0.96 c.c. have been observed under these conditions in a single individual. Of more clinical interest is the fact that during the febrile chill the radial pulse becomes smaller, and in some cases it almost disappears. As the chill abates and the patient begins to feel warm again, the pulse returns to its former size. It seems probable that the small pulse observed during a febrile chill is due to a local constriction of the peripheral arteries and that it does not necessarily indicate impending cardiac failure.

PULSE RECORDERS

About the middle of the past century, instrumental methods were introduced for studying the pulse form. Unfortunately two factors interfered with progress in such studies. In the first place the earlier instruments were subject to grave defects. In order to record the rapid changes of pulse form an instrument must itself be capable of performing rapid movements. Frank and Petter have estimated that an instrument should have a vibration time of not less than 32 per second in order to follow accurately the movements of the pulse in the peripheral arteries and that much more rapid rates are required of instruments which are used to record the pulse in arteries lying near the heart. Since the sphygmographs and manometers in common use vibrate at rates of from 5 to 16 per second, the records obtained by such means are necessarily defective and hence there arose the discussions as to what part of the records were due to "flings" or other instrumental defects. To Otto Frank belongs the credit for having analyzed the theoretical requirements of pulse recorders and for having developed an instrument which will follow accurately the contour of the pulse curve. Frank replaced the usual recording lever on the tambour by a small mirror. This mirror reflects a beam of light, and the movements of this beam are recorded by photographic methods on a moving sensitized surface. Instruments of this type have been constructed which show vibration frequencies of 150 to 250 per second, rates amply sufficient to record the pulse in the central arteries.

The second difficulty in studying the arterial pulse of man lies in the fact that instruments cannot, as in animal experiments, be attached directly to the artery.

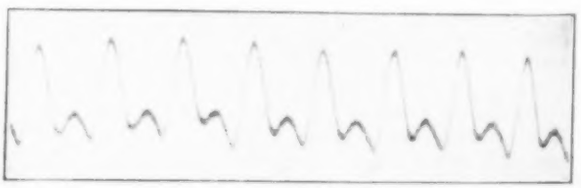

Fig. 2.—Poorly sustained or pointed pulse during fever. Rate, 110.

Variations in arterial pressure can act on the recording device only through the medium of the vessel wall, the intervening tissues and usually some elastic receiver applied to the skin. Our inability to control these factors introduces an element of uncertainty in all pressure records taken from man. For this reason we have preferred to record the volume pulse in the arm by placing the latter in a plethysmograph which is connected with a Frank recorder. The apparatus used shows a vibration frequency of from 50 to 110 per second, a rate which is sufficient to record the peripheral arterial pulse. In the interpretation of our tracings we have been aided by momentarily obstructing the veins leading from the plethysmograph by a pressure cuff. When this is done, changes in arm volume are due almost entirely to movements of blood in the arteries leading into the plethysmograph.

* From the Department of Internal Medicine, University of Michigan.

* Read before the Section on Practice of Medicine at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

TYPES OF ARM PULSE

Records of the volume pulse obtained by this method allow one to distinguish two main types of peripheral pulse in man. In the first, or sustained pulse, the sudden entrance of blood during early systole is followed by a gradual decline that is broken to a greater or lesser extent by the dicrotic and smaller secondary waves (Fig. 1). The second type of pulse is characterized by an abrupt diminution in arm volume immediately after the entrance of the primary pulse wave (Fig. 2). On palpation this gives the impression of a poorly sustained or bounding pulse. In the records the primary wave is pointed and the pulse appears collapsing. It may therefore be described as a poorly sustained, pointed or collapsing pulse. In this pulse the smaller secondary waves are usually absent. The dicrotic wave, however, varies greatly, from marked dicrotism to an almost complete absence of this wave. We believe that the poorly sustained or pointed character of such a pulse is of more fundamental importance than is the size of the dicrotic wave. If the veins leading from the plethysmograph are momentarily obstructed so that no blood can escape from the arm by this channel, it is readily demonstrated that the sudden drop which occurs in such a volume pulse just after the entrance of the main wave is due to a backward movement of blood in the arteries, caused as we believe by a reflection of the primary pulse wave out of the arm.

This pointed type of pulse can be produced in young individuals by therapeutic doses of nitroglycerin or of amyl nitrite. Of particular interest, however, is the fact that it occurs with great frequency during infectious diseases. We have noted it particularly in tuberculosis associated with fever, in typhoid fever and in most severe infections. When circulatory failure threatens during the course of an infectious disease, the pulse is practically always of a pointed character (poorly sustained). At the same time the size of the pulse becomes progressively smaller and its rate increases. We believe that an understanding of these pulse changes would throw much light on the nature of the circulatory failure in the infectious diseases.

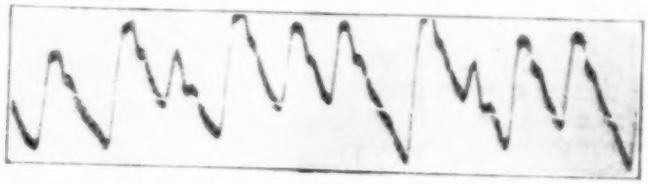

Fig. 3.—Auricular fibrillation. Note that the larger pulse waves are of the sustained type, whereas the small waves are pointed.

Relation to Blood Pressure.—The relation of pulse form to blood pressure is neither definite nor constant. As a rule, patients with arterial hypertension show a sustained pulse; but if nitroglycerin be given, the pulse may assume a pointed form even though both systolic and diastolic pressures still remain far above normal. Patients with abnormally low pressures are prone to show a pointed pulse, particularly if suffering from febrile disease. The association with low pressure is not constant, however, for we have records of sustained pulses where the systolic pressure varied from 90 to 100 and the diastolic pressure from 65 to 70.

Relation to Vascular Tone.—The form of the peripheral pulse is certainly influenced by the condition of the peripheral arteries. The pointed pulse produced by nitroglycerin, for example, is to be attributed to a relaxation of the arteries. Conversely, fairly large doses of pituitary extract, when injected into a patient with a pointed pulse, will often cause the latter to assume a sustained character. Pituitary extract acts mainly by constricting the arteries. It seems certain, therefore, that the form of the pulse is dependent in large part on the tone of the blood vessels.[1]

Just how vascular relaxation leads to a pointed type of pulse is not altogether clear. In the arm of man, at least, nitroglycerin causes no unusual escape of blood from the arteries into the capillaries, nor is the flow of blood in the arm unusually rapid in febrile conditions. The change in pulse form produced by pituitary extract is likewise not accompanied by any constant change in the rate of blood flow through the arm. Finally a very rapid rate of blood flow through the arm, such as can readily be produced by exposure to heat, is not accompanied by a pointed pulse. It is evident, therefore, that the sudden decrease in volume is not due to an escape of blood into the arm capillaries. As has been said, the escape of blood which causes the abrupt fall of volume just after the entrance of the primary pulse wave is due to a backflow in the arm arteries themselves, owing to a reflection of the primary pulse wave. Such a reflection is favored by local vascular conditions in the arm. These consist (*a*) in a relaxation of the larger arm arteries that permits a large pulse wave to enter, and (*b*) in a constriction of the arterioles in the arm which increases the reflection of the waves that reach them.

Relation to Cardiac Output.—There are reasons for believing, however, that the pointed pulse cannot be explained solely on the assumption of changes in the local vessels of the arm. In fever the pulse wave which enters the arm is often unusually small. Furthermore, the pulse obtained by pressure over the carotid and subclavian arteries in such patients often shows a pointed form; Wiggers[2] has published pressure tracings from the central arteries of animals which show a sudden fall of pressure during late systole. Possibly a relaxation of the arteries or arterioles in other parts of the body may play a rôle in such cases, but of this we have little direct evidence.

On the other hand, there is reason to believe that a small or brief systolic output from the heart may contribute to the production of the pointed type of pulse. In auricular fibrillation it sometimes happens that the larger waves are of a sustained character, whereas the smaller waves are collapsing (Fig. 3). These smaller waves are superimposed on a relatively high diastolic pressure, but otherwise the vascular tone may be regarded as constant. In such conditions the pointed pulse must be caused by a small or brief output from the heart. In various forms of tachycardia also the pointed pulse may be attributed to a small or brief systolic output. Finally, the pointed pulse has been observed toward the end and just after the Valsalva experiment.[3] This is independent of blood pressure variations, and is probably to be attributed to a small systolic output at these times.

1. Both nitroglycerin and pituitary extract may also influence the cardiac output, but so far as we know the output is if anything increased by nitroglycerin and diminished by pituitary extract. Such changes would, as we shall see, tend to produce pulse forms of an opposite type to those actually observed during the action of these drugs.

2. Wiggers, C. J.: Studies on the Pathological Physiology of the Heart, Figure 4, III. Arch. Int. Med., July, 1915, p. 140.

3. Lewis, T.: The Influence of the Venae Comites on the Pulse Tracing, with Special Reference to Valsalva's Experiment, and Dicrotism: a Note on Anacrotism, Jour. Physiol., 1906, xxxiv, 391. Similar changes in pulse form have also been recorded by the method described in this paper.

THEORY OF THE POINTED PULSE

In seeking an explanation for the foregoing facts, I wish to call attention to two more or less divergent assumptions as to the nature of the pulse. According to the first and more simple explanation, the larger arteries act like an elastic bag which takes up the blood expelled from the heart and converts the intermittent into a continuous flow. Any fall of arterial pressure during a pulse cycle is attributed to an escape of blood into the capillaries. With a given resistance this escape is somewhat more rapid at high than at low pressures, but no adequate explanation can be given for the very sudden fall of pressure sometimes observed in the central arteries during late systole or for the backflow of blood in the brachial arteries of man during the sudden fall of volume that characterizes the pointed pulse.

According to the second explanation for the arterial pulse, the latter is essentially a wave which spreads over all parts of the arterial tree and is subject to the well known laws which govern wave motion. Ordinarily this wave is of such a character and meets such resistances that it fills the arterial tree promptly and almost uniformly so that the latter behaves for all practical purposes like an elastic bag. This gives rise to the sustained pulse. Under other circumstances, however, the laws governing wave motion become more apparent and must be taken into consideration in attempting to explain changes in pulse form. I would suggest that the sudden fall of pressure which is at times observed in the central arteries toward the close of systole is due to the fact that as a wave passes along an elastic tube it causes an abrupt rise followed by an abrupt fall in pressure, even though there has been no actual backward displacement of the fluid. Similarly the retrograde movement of blood in the arm of man which characterizes the pointed type of pulse can be explained only as a reflection of the pulse wave. The pointed type of pulse, therefore, is one in which for some reason wave motion in the arterial system is particularly evident. Such wave motion would tend to be accentuated by a variety of circumstances, among which are a sudden expulsion of blood from the heart or a relaxation of the larger or smaller arteries. Even though the resistance encountered in the arterioles were sufficient to maintain a good blood pressure, the pointed pulse might still occur, owing to changes in these other factors.

PULSE FORM IN FEVER

In fever the pulse is usually rapid and of a pointed form. In size it may be normal or small. As circulatory failure threatens, the rate becomes more rapid, the pointed or poorly sustained character becomes more pronounced, and the size lessens. Doubtless the increasing rate is in part responsible for the other changes; yet the physician would hesitate to base his opinion solely on the recorded pulse rate or on the rate plus the blood pressures. He resorts to palpation of the pulse, and in doing so gains further information as to its size and quality.

What causes the small size and the poorly sustained quality of the pulse in serious infections? Are they due to arterial relaxation alone? In studying this question we have observed that when pituitary extract is administered to patients showing a pulse of this type, the pointed form can often be converted into a sustained form. Invariably, however, this change is accompanied by a further decrease in pulse size. It seems probable, therefore, that while the pointed character of the febrile pulse is due in part to a relaxation of the larger arteries, this is not the entire explanation for the febrile pulse. The small size seems to indicate that there is in addition a small systolic output from the heart.

The explanation just given is in accord with the view that is now most widely held concerning the nature of circulatory collapse in surgical shock and in the acute infections. According to this view, the difficulty lies in an insufficient blood supply to the heart, owing either to stasis in the abdominal veins or possibly to an oligemia. Henderson has shown that in the type of shock which he studied there is a diminished output from the heart, owing to a lessened supply of venous blood. At first, however, there is no fall of blood pressure, owing to a compensatory constriction of the finer arterioles. Not until the blood stream was reduced to about one third did a rather sudden fall of pressure occur. As yet we have no accurate data concerning the rate of circulation in man during the circulatory collapse of surgical shock and the acute infections. I suspect that such studies will show a reduced circulation. If this should prove to be the case, the attention given by physicians to the size and form of the pulse in surgical and infectious conditions will receive a rational explanation. By palpation the physician gains an impression as to the size of the cardiac output in these conditions.

SOME FACTORS IN THE PRODUCTION OF CARDIAC DYSPNEA*

FRANCIS W. PEABODY, M.D.
BOSTON

The symptoms most commonly complained of by patients with heart disease are palpitation, precordial pain and shortness of breath. The latter, often only noticeable on exertion, is perhaps the most frequent cause of subjective distress, so that for this reason, as well as on account of its seriousness, dyspnea is a symptom worthy of considerable attention from the clinician. A full realization of the significance of dyspnea, and a properly adapted therapy, can only be the outcome of a much more complete understanding of the pathologic physiology underlying it than we possess at present. In all probability it will be found to be a complex phenomenon which can be analyzed into several types, and in the cause of which numerous factors combine in varying degrees. Some of the etiologic factors concerned with the production of dyspnea in heart disease are already recognized fairly definitely, and it is to a consideration of these that the present paper is directed.

It will be well, at the outset, to state exactly what is meant by the term "dyspnea" for, curiously enough, although the word is in everyday use, there is apparently no generally accepted accurate conception of its significance. It is often considered to be synonymous with either rapid respiration or unusually deep respiration, but neither of these in themselves constitute dyspnea. As the derivation of the word implies, there is a subjective element, an element of discomfort or of

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difficulty in breathing. This discomfort may depend on either an increase of the rate or of the depth of respiration, but usually it is associated with an increase in both, and depends fundamentally on a hyperpnea, or increase of the total amount of air breathed in a given unit of time. Technically, it is customary to express the pulmonary ventilation, or the amount of air breathed, in liters per minute, and this is referred to as the minute-volume. Dyspnea is present when the minute-volume approaches the maximum of which the subject is capable.

Thus, for instance, a healthy adult at rest may breathe approximately 500 c.c. per respiration, and at a rate of twelve respirations per minute. The minute-volume will then be 6 liters. On walking slowly about the room the metabolism is increased and the minute-volume of air breathed will rise nearly threefold, to about 15 liters. On walking up a flight of stairs the minute-volume may become 20 liters. Neither on walking about the room nor going upstairs, however, does the normal subject become dyspneic. By increasing somewhat both the rate and depth of his respiration he is able to raise the minute-volume from 6 to 20 liters without any appreciable subjective sensation. When, on the other hand, he begins to run, and his metabolism becomes increased so that it requires a ventilation of 60 to 70 liters a minute, he becomes dyspneic, for he has usually approached both the maximum rate and depth of respiration of which he is capable. An athlete in good training can ordinarily breathe much deeper than the individual of sedentary habits, and he may be able to raise the volume of air breathed to 80, 90, or even 100 liters a minute without any definite feeling of distress.

In brief, then, the production of dyspnea resolves itself into the problem of the relation between the demand for an increased pulmonary ventilation and the ability of the subject to meet that demand by increasing the rate and depth of his respiration. This somewhat artificial statement of the situation purposely omits reference to one very important factor, namely, the rate of the circulation. The fundamental purpose of the respiration is, of course, to promote gaseous exchange in the body tissues and this is only effected through the medium of the blood. A slow blood flow would interfere with the process of metabolism as much as would an insufficient pulmonary ventilation. One of the results, however, of an inadequate blood flow would be a further stimulation of the respiratory center. The data available with regard to the rate of the circulation and especially concerning its relation to pulmonary ventilation are so scanty and unreliable that it seems best at present to keep the attention focused wholly on the external respiration.

The factors which may produce dyspnea are, in the first place, those which cause an increase of the minute-volume of air breathed, and, in the second place, those which abnormally limit the ability of the subject to meet this increased demand. As causes of an increase in the minute-volume of air breathed there are, apart from nervous and psychic influences, three main factors to be considered: a rise of metabolism, an acidosis, and any change in the physical condition of the lungs which results in a less efficient utilization of the air breathed. The causes which tend to prevent the increase of ventilation are chiefly those which interfere with the depth of the respiration and cause a decrease in the "vital capacity" of the lungs.

In what degree, then, are these various factors to be considered as playing a part in the production of dyspnea in cardiac disease?

What, in the first place, is the state of the body metabolism? The information now at hand is based chiefly on work done in the bed calorimeter at the Russell Sage Institute for Pathology in New York, which has been subsequently confirmed and amplified by observations with the Tissot spirometer at the Peter Bent Brigham Hospital in Boston. The results show that in well-compensated patients the metabolism is within the normal limits, while in patients who are on the edge of decompensation, or who show some slight dyspnea even at rest, the metabolism is often, but not at all regularly, some 20 to 40 per cent. above the normal. Unfortunately, it has not been possible, for obvious reasons, to study severely decompensated patients. It is quite probable that in such cases the metabolism would be found to be considerably higher, but even were it double the normal, the rise in metabolism could only be regarded as in itself a minor factor in the production of dyspnea.

Much attention has been recently devoted to the rôle of acidosis as a cause of dyspnea in heart disease, but as yet its true significance is not wholly clear. It is possible that in certain acutely decompensated patients with pure cardiac disease, during the period when they are having severe dyspnea even while at rest in bed, there may be some slight acidosis which stimulates the respiratory center, causing an increased pulmonary ventilation. The condition is, however, transient and disappears quickly as compensation is regained. Acidosis is certainly a more imporant element in those cases in which cardiac insufficiency is associated with severe renal lesions. In them an acidosis frequently develops secondary to the nephritis. In a small percentage of instances with uremia the acidosis may be of such high degree as to cause hyperpnea resembling that of diabetic coma, but even in the more common mild grades of acidosis it has been shown to be a factor which renders the patient unusually sensitive to the production of dyspnea. While acidosis may thus play a part in the causation of dyspnea in many advanced cases of cardiorenal disease, it has not been shown to be of importance in cases which are even moderately well compensated or are without severely injured kidneys.

The significance of physical changes in the lungs in the production of hyperpnea has been demonstrated by studies with the spirometer, which show that the minute-volume of air breathed by patients with heart disease may be considerably increased, even quite apart from an abnormally high metabolism or an acidosis. Patients who are wholly without dyspnea while they are quiet may be found to be breathing 9 or 10 liters of air a minute instead of the usual normal of about 5. Since the total metabolism is approximately normal, the output of carbon dioxid per minute is normal, but as the volume of air breathed per minute is increased the expired air contains a percentage of carbon dioxid which is less than normal. These patients may be perfectly comfortable while at rest, but their reserve is greatly interfered with, and they suffer as soon as they begin to move. The minute-volume of a normal person walking slowly about in the room is about three times as great as it is while he is sitting quietly. Thus, if he breathes 5 liters a minute at rest, he will breathe nearly 15 liters when performing this exercise. A cardiac patient will show a similar relative increase of ventila-

tion, but as he may be breathing 8 liters a minute at rest, the volume on walking will rise to nearly 24 liters. The cardiac patient is thus distinctly nearer to the maximum of which he is capable, especially when, as will be shown, his maximum is much less than that of the normal person. This increase of the pulmonary ventilation seems to bear a close relation to changes in the vital capacity of the lungs, and it may depend on the fact that there is a decrease in the respiratory surface of the lungs without a corresponding change in the dead space, so that a larger amount of air must be breathed in order to obtain the normal amount of oxygen per minute. While an increase in the minute-volume of air breathed due to such a cause is found not only in patients who are acutely decompensated, but often in those who are quite comfortable while at rest, it is, nevertheless, of importance only in the rather severe cases.

Such are the factors concerned with the production of dyspnea which act by increasing the pulmonary ventilation. As opposed to these there is at least one important feature which makes it difficult for the cardiac patient to meet a demand for an increase of his pulmonary ventilation. This is his inability to breathe deeply. An accurate index to the degree to which the depth of respiration is limited may be had by the measurement of the vital capacity of the lungs, which is the volume of the greatest expiration after the deepest possible inspiration. This is regularly below normal in cardiac patients who complain of dyspnea. It has long been known that many persons with heart disease cannot breathe as deeply as normal individuals, but the significance of this fact has been rather disregarded. It is, however, readily appreciated when one considers that a rise of pulmonary ventilation is brought about by increasing the rate and depth of breathing, but best and most economically by increasing the depth. If, then, a patient with heart disease is unable to increase the depth of his respiration as well as a normal person, he will be at a distinct disadvantage when he begins to exercise and his metabolism rises. On account of his inability to breathe deeply, the maximum amount of air that he can breathe per minute will be below the normal, and a grade of hyperpnea that will cause no symptoms in a healthy individual will produce in him the subjective sensation of dyspnea. There is, indeed, a very close relation between the decrease in the vital capacity and the tendency of a patient with heart disease to become dyspneic. In a large series of cases in all stages of cardiac disease the decrease in the vital capacity has been found to run almost constantly parallel to the degree of physical disability. Practically all patients who give a history of abnormal shortness of breath on exertion are found to have a vital capacity below normal, and the more prominent the symptom, the lower the vital capacity. This decrease in the vital capacity characterizes both mild and severe cases of heart disease so far as they have a tendency to dyspnea, either at rest or on moderate exertion, and seems the most constant factor in the etiology of the dyspnea.

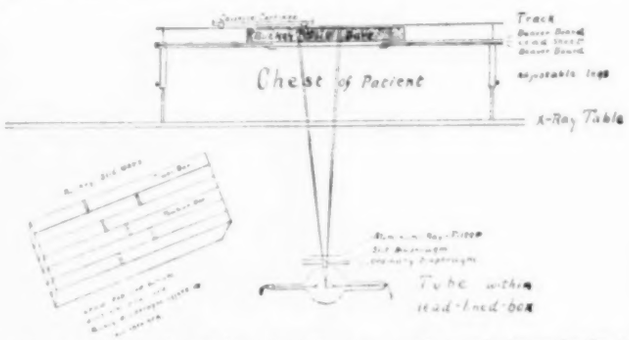

Fig. 1.—Device for making simultaneous tracings of the pulsations of the heart chambers and of the aorta, by the Roentgen rays.

Briefly, then, we may summarize by saying that in patients with heart disease a decrease in the vital capacity of the lungs is an important and practically constant feature in the production of dyspnea. Associated with this, and apparently depending on it, there is usually a hyperpnea in the more severe cases. In many severe cases further causes of dyspnea may be the presence of an acidosis, and, to a less extent, an increase of body metabolism.

ROENTGENOCARDIOGRAMS

POLYGRAPHIC SLIT TRACINGS OF CARDIAC PULSATIONS BY THE ROENTGEN RAY *

A. W. CRANE, M.D.
KALAMAZOO, MICH.

The purpose of this paper is to show the practicability of Roentgen-ray tracings of the heart beat and to arouse interest in this method of cardiac study.

It is sixty-nine years since Vierordt made the first tracing of the pulse. Marey, Dungeon, Jaquet and other clinicians of the first rank designed sphygmographs and interpreted tracings. But it was not until Mackenzie, barely fourteen years ago, working with a polygraph of his own manufacture, in a country practice in Scotland, recorded a body of observations single handed, that cardiac tracings became of recognized clinical value.

Einthoven in 1903 produced that miracle of delicacy and precision, the electrocardiograph. Gocht and Rosenthal in 1912 published a method, termed "roentgenkymography," of making polygraphic Roentgen-ray tracings of the movement of the heart. This is the only paper on the subject that I have found.

It remained for the researches of Mackenzie, Lewis and many others to correlate cardiac tracings with the functions of the sinus node and the auriculoventricular bundle of His, and thus to translate polygrams and electrocardiograms into clinical terms. In consequence a new understanding of the irregular and disordered heart has been laid, on which has arisen a new nomenclature. Auricular fibrillations, heart block, auricular flutter, alternation of the pulse, extrasystole, are terms which have thus passed into current medical literature. In conjunction with these, we are becoming familiar with such technicalities as the a c p or t wave or of the a c interval.

This flood of renewed interest in the old problems of the heart beat has left the whole subject of Roentgen tracings untouched. Gocht and Rosenthal demonstrated the possibilities of Roentgen tracings of the heart-beat; yet their paper dropped into that oblivion of scientific archives from which so few ever return.

At the present day we have the advantage of many improvements in Roentgen instrumentation and technic which combine to make roentgenocardiography a

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practicable clinical method. These improvements are, briefly, the Coolidge tube, ray filtration, the "Buckey effect" which is possible by the use of cellular slits, large films and safe and convenient tables.

The Roentgen examination allows the clinician to determine the shape, size and position of the heart in the chest with a precision unapproachable by any other method. A visual study may be made of the character of the muscle movement of the different chambers from different angles. The cardiac sounds may be ausculted while the heart is beating visibly on the Roentgen-ray screen. The aortic silhouette and pulmonary artery may be scrutinized, and finally without moving the patient from the table, polygraphic tracings may be made directly from the cardiac chambers.

A Roentgen tracing of the heart means to most medical readers a tracing of the outline of the heart. The subject of this paper, the roentgenocardiogram, is a tracing of the heart beat obtained by covering the heart with strips of sheet lead so arranged that a narrow slit in the lead can be adjusted over the pulsating margin of the cardiac silhouette as viewed by the Roentgen ray. Several of these slits can be adjusted simultaneously over different areas of the pulsating heart, the aorta and the pulmonary vein. A photographic film on a screen in a cassette is then made to travel at a given speed, transversely over these slits, while the Roentgen ray is turned on. The result is a tracing which is similar to and comparable with a sphygmogram, a polygram or an electrocardiogram.

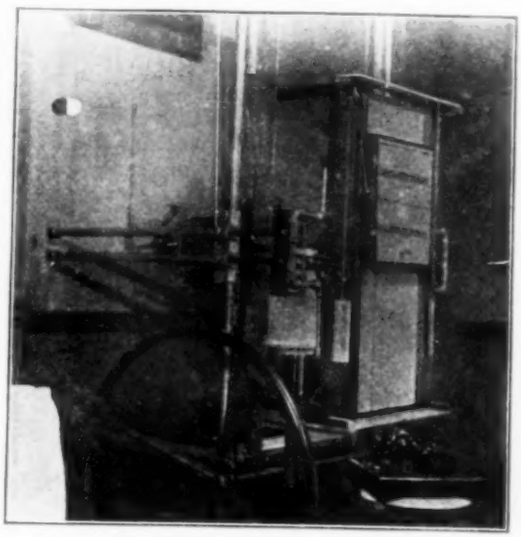

Fig. 2.—Apparatus in the upright position.

For comparison: The electrocardiogram, as you all know, is a tracing obtained on a strip of photographic film which moves across a slit. Running at right angles to this slit is a very fine metallic filament which vibrates with the electric currents excited by the heart muscle. An electric light behind the filament prints the vibrations on the moving film. A microscope is arranged so as to magnify these vibrations and thus yield a tracing having the requisite amplitude.

In the case of the roentgenocardiogram the wire filament is replaced by the edge of the heart muscle itself and the light is replaced by the Roentgen ray. There is no other essential change. No microscope is required.

In the electrocardiogram we deal with the electrical changes in the heart; in the sphygmogram or polygram we deal with pressure variations within the blood vessels (excepting in the case of the apex beat); but in the roentgenocardiogram we deal directly with movements of the heart muscle. The electrocardiogram is stated to give a record of both auricles contracting as a unit and of both ventricles contracting as a unit. The sphygmogram or polygram gives records of the venous pulse and the left ventricle. But the roentgenocardiogram is capable of giving a separate record of the muscle movements of each chamber of the heart. In this respect it stands unrivaled.

Tracings have been obtained experimentally by connecting the nose with a tambour and having the subject hold the glottis open during suspended respiration. Also tracings have been obtained from a rubber tube in the esophagus. The claim has been made that these tracings represent the pulsations of the right ventricle and the left auricle. But it may be stated that the roentgenologic method is the only one which can furnish unquestionable tracings of these separate chambers of the heart, and produce them so as to be clinically practicable.

It is evident that the polygraph, the electrocardiograph and the roentgenocardiograph, while recording different data, yet arrive at the same conclusions regarding cardiac irregularities. Auricular fibrillations, heart block or auricular flutter would be recognized in substantially the same way by any one of these instruments.

The electrocardiogram is a photomicrograph. The real amplitude of the oscillations of the wire filament between the field magnets is so exceedingly small that the microscope is required. The amplitude of the writing hand of the polygraph or sphygmograph depends on mechanical multiplication by levers and tambours. But the amplitude of the heart muscle movement is sufficient without the use of any means for magnification. Some increased amplitude is unavoidable, however, and it is easy to increase it still further.

In the case of both the polygram and the electrocardiogram there is a complexity of machinery between the heart of the patient and the tracing. But in the case of the roentgenocardiogram the heart writes its record directly on the film without essential intervention of anything whatever. In the case of the polygraph or sphygmograph the impulse which moves the levers and writing fingers is transmitted through a varying length of artery or vein and also through rubber tubing or levers. The jugular tracings are rendered impure by the impulse of the carotid. But the Roentgen tracings are necessarily free from any and all of these complications.

In the case of the electrocardiograph we are working with one of the most complex and delicate of modern clinical instruments. It is of foreign manufacture. Repairs and replacements are likely to be difficult, expensive and subject to long delays. In the case of the roentgenocardiograph we are working with a Roentgen-ray equipment which is largely standardized and made in this country. The addition required for the average Roentgen laboratory is so essentially simple that it can be made extemporaneously by the average mechanic, excepting for the motor or clockwork which runs the cassette carriage and marks the time.

The polygraph has the disadvantage that, in a large proportion of cases, it is impossible to secure a venous tracing from either neck or liver. The electrocardiograph when in order and free of vibrations has very few disadvantages. However, it is, of

course, necessary that the patient remain free from muscle movements during the taking of a tracing. The contraction of any muscle excites an electric current. To bend a finger is to mark a tracing. Patients with exophthalmic goiter, paralysis agitans or any other disease associated with involuntary muscle movements are not suitable for the electrocardiograph.

The position of the heart in the chest is also of the greatest importance. A preponderance of heart muscle to the right would reverse an electrocardiogram. Three leads are used and three tracings made as a rule with each patient.

The disadvantages of the roentgenocardiograph are:

1. Very large, heavy patients offer resistance to the passage of Roentgen rays. This is overcome by using wider slits, a slower movement of the carriage and a ray of higher penetration.

2. Some patients with cardiac disease cannot lie in the horizontal position. This difficulty can be overcome by the sitting position, in which case the patient is placed with the back against the lead screen of the cardiograph and with the tube in front. Each slit must then be adjusted over an interspace between ribs, and especial pains must be taken to immobilize the patient.

3. Patients with advanced tuberculosis, pneumoniá or pleuritic or pericardial effusions are not suitable for Roentgen tracings, because the outline of the heart is obscured or actually concealed. Dense deposits at the hilum of the lung running downward along the heart border usually are an advantage rather than otherwise, because there is a narrow clear space between the heart and these deposits which improves the tracing.

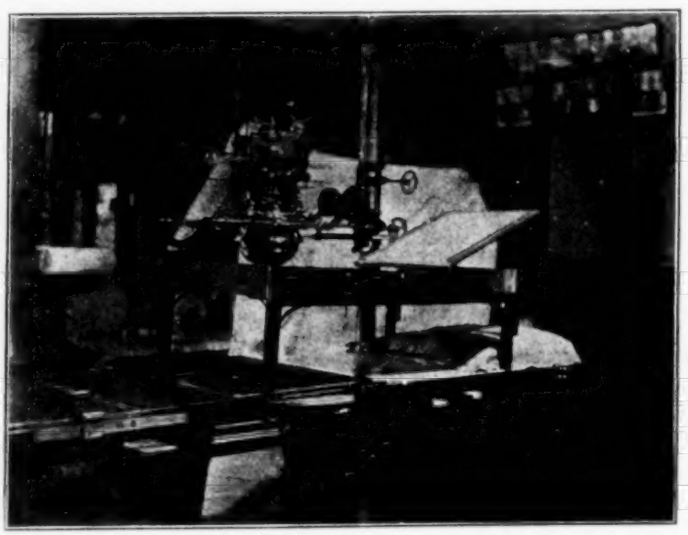

Fig. 3.—Apparatus in the horizontal position.

Some electrocardiographs are equipped with tambours so that ordinary polygraphic tracings may be run simultaneously with the electrocardiogram. Valve sound tracings may also be included. The roentgenocardiograph may likewise be equipped with tambours and a sound recorder. The Roentgen ray is an ideal agent for the registration of movements of metallic pointers.

The addition to a Roentgen-ray equipment which will enable the operator to make roentgenocardiograms is best illustrated by lantern slides. I use a simple, crude device made by my own hands. It remains for some instrument maker to supply us with a properly made roentgenocardiograph. It should consist of a lead-covered table, having an open square of 8 inches in the middle. It is convenient to use 10 by 12 films in cassettes. The cardiographic table, therefore, should have a lead covered length of 12 inches beyond the opening in each end. This makes the table 32 inches long. The legs of this table should be adjustable so as to allow the table to be placed over the recumbent patient without touching the face or abdomen. A track and carriage allows the film to travel from one end of the table to the other over the opening. The carriage should be provided with a clockwork or motor which will give several speeds to the film. The average speed required is 5 cm. to the second. An accurate timing device is desirable, but accurate timers in use on the Roentgen-ray machine may be utilized so that a centimeter rule may be laid along a film to give time divisions if, for example, exactly 50 cm. of film have taken ten seconds of Roentgen-ray exposure.

Instead of a table and carriage, we may use a lead covered cylinder on which is rolled the intensifying screen and film properly protected from light. The rotation of the cylinder over a single long slit will provide the mechanical requirements, in a very compact form, for simultaneous tracings of the pulsations of the right auricle and left ventricle.

It is obvious that the narrower the slit or the faster the speed of the carriage, the sharper will be the line of the heart tracing, provided the Roentgen-ray exposure is properly measured. The average width of slit which is practicable is found to be 2 cm. The slower the transit of the film, the narrower may be the slit while preserving the same Roentgen-ray exposure of the film.

If the film travels 5 cm. to the second and the slit is 5 cm. wide, then the exposure of the film will be one second. But $\frac{1}{20}$ second is sufficient for a film on a screen in a cassette. Therefore our slit may be 1 cm. wide. But 2 cm. is an average which gives good definition and allows more latitude for differences in patients. In my experience a Coolidge tube, medium focus, set for a 5-inch spark gap and 33 milliamperes will stand the run ten seconds without trouble. The distance of anode from film should average 24 inches.

In order to adjust the slit bars it is necessary to use the fluoroscopic screen. Two to three milliamperes with a tube set for 7 or 8-inch spark gap is ample. Three mm. aluminum filter should be used to increase the time limit for observations. The erythema dose should never be reached. The fact that the patient may be turned in other positions for additional tracings gives the opportunity for repeated observations within the limits of safety.

The use of a narrow slit of Roentgen ray provided by the slit diaphragm greatly extends the time limit of safety. Different sections of the heart silhouette may be used with each tracing, so as to give added information. This exposes new skin areas each time. The use of the film between two screens greatly lessens the exposure time. By these precautions the number of tracings permissible with safety would be beyond any number required for practical purposes.

The Roentgen-ray operator should know in each case exactly what quantity of Roentgen ray his patient is receiving, as a matter of system and record.

It will be noticed from these tracings that there is a striking dissimilarity between the movements of the auricles. The right auricle frequently gives a nearly straight or faintly undulating line, while the left auricle at the same time gives a very definite curve. Again, the right auricle gives a curve of collapse while the left gives a curve suggestive of contraction.

The roentgenocardiogram shows particularly well the ventricular form of the right auricular curve when present, thus demonstrating small regurgitations through the tricuspid valve which are not discoverable otherwise. This ventricular form of the right auricular pulsation must be shown to be concomitant with a corresponding subsidence of the left auricular beat. A question arises concerning transmitted movements of a ventricular beat to other parts of the heart.

In the belief that the roentgenocardiogram with the associated Roentgen-ray study of the working heart will aid in the understanding of cardiac physiology and pathology, I urge the practice of this method.

NOTE.—The article by Dr. G. Canby Robinson which was read as a part of this symposium will appear in the *Archives of Internal Medicine*.

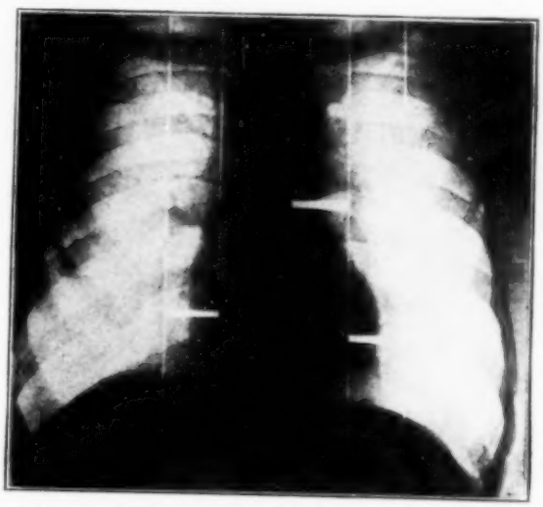

Fig. 4.—Roentgen image of heart, showing position of slits when adjusted over right auricle, left auricle and left ventricle.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. HEWLETT, ROBINSON, PEABODY AND CRANE

DR. FRANK N. WILSON, Ann Arbor, Mich.: Abnormal ventricular complexes in the human electrocardiogram may signify the presence of one or more of the following conditions: (1) Impulse formation within the ventricular conduction system below the bifurcation of the His bundle or within the muscle of the ventricular walls as in premature ventricular beats; (2) abnormal intraventricular conduction as in bundle-branch-block; (3) an abnormal distribution of the ventricular muscle as in right or left ventricular preponderance; or (4) a change in the electrical state or condition of the ventricular muscle as in the abnormal ventricular complexes showing inverted T waves obtained by the administration of digitalis to normal individuals. Dr. Robinson's paper deals with marked changes in the QRS group and this group of waves is affected, so far as I know, by the first three conditions only. The ventricular complexes of right and left ventricular preponderance are characteristic and entirely different from the abnormal complexes under discussion. Furthermore, the impulses in all but one of Dr. Robinson's cases were supraventricular in origin. We must assume, therefore, that abnormal intraventricular conduction was responsible for the abnormal complexes in these instances. I have seen abnormal ventricular complexes similar to those described by Dr. Robinson in several instances, but have not been able to correlate them with functional insufficiency of the heart. They have also been a permanent feature in the cases I have observed. One must believe that when this is the case there is an organic lesion of the ventricular conduction system rather than a functional depression of this system as seems to have been the case in the patients studied by Dr. Robinson. I have also seen instances in which only a single part of the QRS group was abnormal. For instance, I have several times seen in lead 1 a perfectly normal R wave associated with a very broad distinctly abnormal S wave. In such instances it would seem that a circumscribed lesion of the ventricular conduction system is present or that the functional depression of intraventricular conductivity is local rather than general. I agree with Dr. Robinson's interpretation of the curves he has shown and feel that his conclusions are justified at least so far as the cases he has studied are concerned.

DR. S. MARX WHITE, Minneapolis: I have been interested in trying to learn how far we can go in making a correct diagnosis of premature ventricular systole by polygraphic tracings independent of the electrocardiogram, since the latter is accessible to relatively few. The occurrence of extrasystoles can usually be detected by using the stethoscope, the first and second tones, or the first tone alone, being audible. What Lewis says about exercise is of value. In a study of about 150 cases we find that the use of exercise is of value in differentiating extrasystolic from other types of irregularity. Have the patient exercise. During the exercise the premature beats will lessen in number in the great majority of cases. Following rest there will be an increase in the number per minute and they will become very clearly defined. The point brought out about extrasystoles being functional should not be allowed to pass without more discussion. I am convinced that premature ventricular beats mean more than a functional disturbance. It may be that an increased tension in the heart wall is capable of exciting them, but a focus of increased irritability in the heart wall is also a likely source for premature beats. I am particularly interested in the cases in which infection is found about the teeth or tonsils. In these cases with focal infection I wish to call attention to the fact that such infection seems to have a predilection for the heart wall. I think we must look on these as cases in which there is an actual microbial infection of foci in the heart wall. It has been shown that in rabbits there is very frequently an infection of the myocardium when injected intravenously with fresh cultures of micro-organisms taken from the tonsils or the walls about the tonsils. Such small foci of myocardial infection may readily become foci for increased irritability and thus sources of extrasystole. I am skeptical and must be shown and have proved to me that this condition is functional. It must be shown definitely that there is no such change as I have suggested. We see acute infections and often an apparently complete recovery of the heart muscle. May we not have in the heart muscle small foci of inflammation producing extrasystoles and yet have recovery so that later normal function is restored?

DR. PHILIP S. ROY, Washington: Has the reading of heart charts any relationship to the therapeutic treatment? Yes. I think every physician should have an apparatus for drawing the radial pulse; it is not necessary to have a time marker. With such an apparatus one will be aided greatly in his therapeutic treatment. Fibrillation of the auricle can be learned from a radial tracing. As regards therapeutic application, we all know that digitalis is a specific in fibrillation of the auricle although not curing the conditions causing it. There is another condition, sinus arrhythmia, that causes much anxiety to both the family and the physician, but so soon as the radial drawing is studied we learn that the condition is not a serious one. When we make charts we should learn how to recognize sinus arrhythmia, a condition which can be cured by belladonna. Another condition is extrasystoles, which in a large percentage of the cases can be recognized by means of the radium charts. Then the

therapeutic application must be made. Another condition, a hopeless one, is pulsus alternans. I cannot make a diagnosis of this condition without a radial chart. Does the condition of the pulse always indicate the condition of the whole vascular system? I do not think so. In anaphylactic shock the patient may be pulseless, yet the heart is doing good work. All should have an apparatus for radial tracings, if we wish to be fair to our patients.

Dr. Hugo A. Freund, Detroit: The polygraph and electrocardiograph have cleared up many things that we have not previously understood. The roentgenocardiogram will probably enlighten us further. There are a number of points, however, that should be established before conclusions are drawn. First, the stability of construction of the apparatus eliminating sources of mechanical error. Second, the projection of the ray. Third, the relative distance between the patient and the screen. All these will require standardization. If we could have an orthogonal projection and a tracing of such rays with the moving heart, then doubtless an accurate tracing would be assured. I wish to emphasize something of interest that I have noticed in reference to the changes seen in the Q, R and S waves. In those cases of slow ventricular rhythm where the deformity of the wave is as indicated by Dr. Robinson, the tendency to sudden cardiac failure exists. In cases of marked decompensation where a tendency of this complex to return to a more normal outline is seen under treatment, the prognosis for the time being is more favorable.

Dr. Francis W. Peabody, Boston: The administration of an alkali will relieve the symptoms, as far as they are due to an acidosis in chronic nephritis, but it is only in exceptional cases that a definite clinical effect is obtained.

Dr. Albion Walter Hewlett, Ann Arbor, Mich.: In my opinion extrasystoles arise from some part of the heart muscle which is unusually irritable and for this reason initiates a premature beat. The region initiating the extrasystole may be very small and the heart muscle as a whole may be in good condition. Furthermore, the excessive irritability may be due, not only to organic disease, but to toxic influences or possibly to nervous changes. The presence of extrasystoles is an indication for a careful heart examination but the prognosis depends on this examination rather than on the irregularity itself. Dr. Peabody's careful and extensive study of cardiac dyspnea has led to the conclusion that in the main this is due to changes in the lungs. It may be recalled in this connection that mitral lesions which cause pulmonary congestion are apt to be associated with early dyspnea, whereas aortic lesions cause dyspnea only in their later stages. Great possibilities for further studies of the cardiac mechanism are opened up by Dr. Crane's work. The information thus obtained differs, however, from that furnished by the electrocardiograph for the reason that the records depend on mechanical and not on electrical changes associated with the heart's movements.

Dr. John Ernest Greiwe, Cincinnati: Premature ventricular systoles are a functional disturbance. It should be our duty to look for and find the cause of such disturbance and by removing the cause, get rid of the trouble. To bring this subject home in a most practical way, let me recite briefly the experience of a man who had been operated on for appendicitis. On the second night after the operation, the patient had an irregular pulse. This alarmed both nurse and physician, who immediately resorted to subcutaneous salt solution, with the result of producing a large slough over the breast. The irregularity, as I later discovered, had often been present and as the patient afterward remarked, "I could have told them immediately not to become alarmed if I had only known why they were so disturbed." In this case, the "Much Ado About Nothing" came near resulting in a damage suit.

NAIL EXTENSION IN FRACTURES OF THE LOWER EXTREMITY*

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NEW YORK

In most fractures of the lower extremity, the well established methods of immobilization by plaster cast or of continuous traction by Buck's extension or Hodgen's suspension will prevent shortening. Open operation is rarely indicated—in less than 5 per cent.—according to Darrach, with whom I fully agree.

There is a definite group of exceptional cases in which none of the aforementioned procedures are applicable; here, nail extension has proved of value. According to this method, continuous traction is applied to the ends of a steel nail transfixing the lower fragment at a point well away from the site of fracture (Figs. 1, 2, 3 and 4). The nail is removed at the end of from twenty-eight to thirty-five days. As a rule, by this time there is enough callus to prevent shortening. Needless to say, introduction and extraction of the nail are performed under anesthesia and with the strictest aseptic precautions. I have already fully described[1] the details of technic.

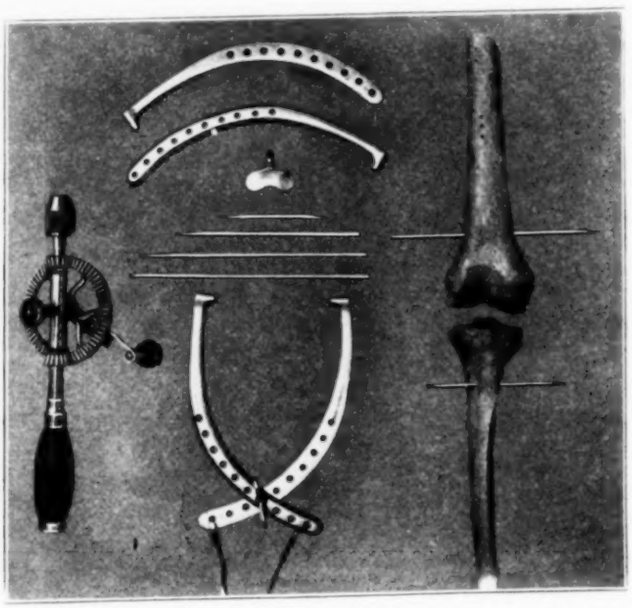

Fig. 1.—Instrumentarium; nails, hand drill and tongs assembled and taken apart; femur and tibia transfixed by nails in typical positions.

Nail extension has been preeminently valuable in the following conditions:

1. *In recent simple fractures with extensive abrasions so that a cast or Buck's extension, etc., is contraindicated.* The following case will serve as an example:

Case 30.—O. T., a boy of 6, had been run over by an automobile, April 20, 1915. He was admitted to Mount Sinai Hospital to the service of Dr. Edwin Beer. There were fractures of both femurs at their middle, and extensive abrasions of thighs, legs and feet. Small areas of intact skin remained just below the knees. Infection of the abrasions over the right thigh led to infection of the underlying fracture hematoma (as shown by high fever on the seventh and eighth days); the abscess was drained at midthigh and buttock on the ninth day (Fig. 5).

* Read before the Section on Surgery, General and Abdominal, at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

1. Gerster, J. C. A.: Am. Jour. Med. Sc., August, 1913, p. 157.

Knowing my interest in such cases, Drs. Beer and Elsberg kindly permitted the patient to be transferred to the latter's service (the Third Surgical Division) at this time.

On the eleventh day (May 7), nail extension was temporarily applied to both tibiae below the knees (for position see Figure 1). By making traction directly upward, the thighs were kept vertical, thus preventing purulent discharges from seeping into the nail holes. The knees were flexed at right angles and the legs were suspended by suitable loops in a horizontal position. Figures 6 and 10 show the condition of affairs three weeks later (May 28); there is no shortening on the right side, but considerable overlapping on the left.

After twenty-three days of extension (May 30), the abrasions of the lower parts of the thighs had healed. Accordingly, a second pair of nails was made to transfix the femurs just above the condyles, and those through the tibiae were withdrawn. Figures 7 and 11 show nails in the typical supracondylar position; there is no shortening (June 7). A little over three weeks later (on the forty-sixth day of extension and twenty-fourth day of supracondylar extension, June 23) there was firm union of the left femur; extension on this side was discontinued.

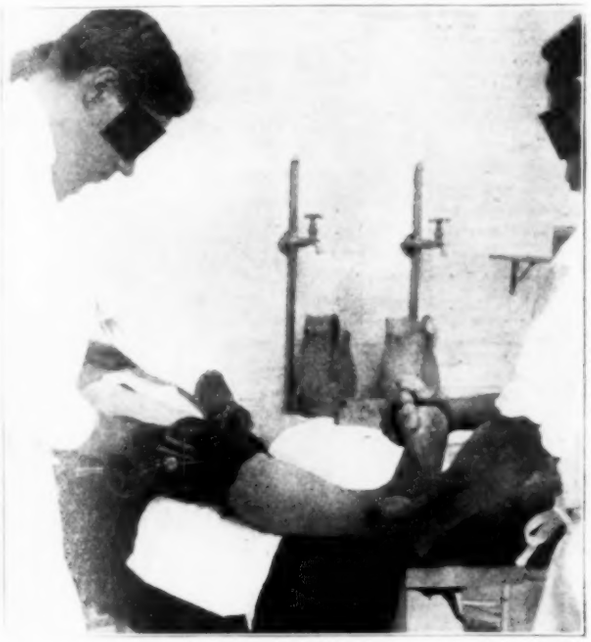

Fig. 2.—Insertion of nail. The patient's hip, knee and ankle lie close to the margin of the table. One assistant grasps the foot (holding its inner margin vertically) and exerts traction. Another assistant, whose left arm and hand are clearly seen in the picture, pulls upward on the skin of the thigh. The nail penetrates the soft parts one finger's breadth above the upper margin of the external condyle. Nitrous oxid anesthesia is maintained during the brief period required for drilling through bone and soft parts.

The compound fracture on the right side consolidated much more slowly, so that the nail was not removed until the thirty-seventh day after its application (July 6, seventy-one days after fracture). There was no sequestration. Two weeks later (July 20) all wounds had healed, but, as the child was backward in learning to walk, he was kept in the hospital twenty-two days longer (being discharged, August 11, 107 days after fracture). Figures 8 and 12 taken August 5, show the fractures firmly healed. Six months later (Feb. 3, 1916) there was firm bony union (Figs. 9 and 13).

It is well not to employ nail extension in any one locality for longer than about thirty days; in this case additional time for traction was gained by utilizing two sites of attachment in succession.

During the early part of the treatment (from the eighth to the twenty-second days of extension) when traction was still applied to the tibiae, I was absent, and it so happened that undue traction on the right side produced a moderate subluxation of the knee and overdistraction of the femoral fragments (Fig. 6). Some shortening followed relaxation of traction (on the twenty-third day), but it was not sufficient to make the legs equal and this side remained half an inch longer. There was no permanent relaxation of

Fig. 3.—Application of occluding dressing (begun). The projecting nail ends transfix heavy pads of sterile gauze, which can be seen turned aside to expose the nail just where it emerges from the skin. After aristol (thymol iodid) and collodion are applied, the gauze is reduced and covered by a bandage.

the knee joint; a slight but very persistent limitation to full extension, however, lasted for many months, which finally yielded after prolonged immobilization in plaster. The child is now (June 1, 1916) without a limp (Fig. 14).

In this connection it is well known that undue traction on the leg will produce a subluxation of the knee joint. Such a complication can be avoided only by most careful management. Figures 15 and 16 show reduction of an oblique supracondylar fracture of the

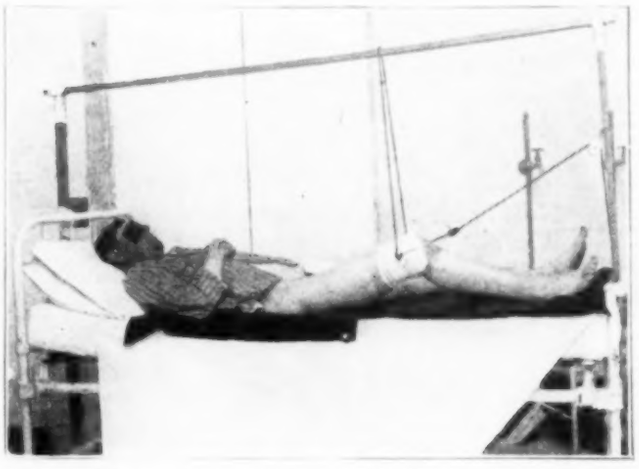

Fig. 4.—The traction exerted through tongs and rope suffices to keep the thigh suspended in semiflexion; suspension of nail ends to the overhead bar is mainly to prevent rotary displacement. For the sake of simplicity, the subsequent suspension of the foot (to barely clear the bed) has not been shown. From this illustration it can be seen that wounds of the leg or foot can be dressed without disturbing traction on the thigh.

femur in a woman of 35 (Case 23) by nail extension applied to the head of the tibia. Similar applications of traction in three other cases (3, 4 and 10) have

likewise shown no ill effect on the knee. It is my opinion that traction on the semiflexed knee joint is less harmful than on the fully extended joint, the ligaments of which are already stretched to their full extent.

Figure 17 shows a fracture of both bones of the leg in a woman of 45. (Case 25, Knickerbocker Hospital, service of Dr. H. D. Collins.) By the end of four days, so many blebs had developed that a cast was out of the question. Nail extension for twenty-two days resulted in a satisfactory reduction (Fig. 18). There was no delay in union.

2. *In recent compound fractures with much destruction of the soft parts,* nail extension has proved of value, especially during the first few weeks, when suppuration is at its height. The patients derive great comfort because the wound can be dressed and the bedclothing changed without disturbing the fracture. The method has found favor with some of the American surgeons now working in France.[2] According to Dr. Hermann Fischer of the German Hospital, New York, the German surgeons are making extensive use of the method.

3. *In multiple injuries to the same limb,* the method affords innumerable opportunities for improvisation. A railroad employee (C. H., Case 9) had sustained a comminuted fracture of the femur and a crushed foot. A glance at Figure 4 will show how dressings of the injured foot were made without disturbing the traction on the femur (Polyclinic Hospital, service of Dr. J. A. Wyeth, Nov. 22, 1912).

In another case there was a fracture of the upper third of the thigh and a comminuted fracture of both bones of the leg just above the ankle. There were many abrasions of the thigh. Supracondylar nail extension prevented shortening of the femoral frac-

Fig. 5 (Case 30).—May 6, 1915, ten days after fracture of both thighs. Extensive abrasions precluded application of a cast or any form of adhesive plaster extension. The fracture hematoma on the right became infected and was drained at midthigh and buttock.

Fig. 6 (Case 30).—May 28, twenty-one days after nail extension. Right femur, anterior (*a*) and lateral (*b*) views. Compound fracture drained by tubing.

Fig. 7 (Case 30).—June 7, thirty-one days after extension. Right femur, anterior (*a*) and lateral (*b*) views. Note nail in typical position.

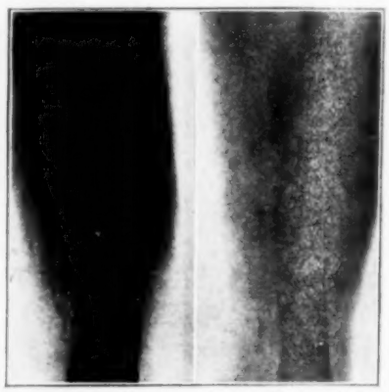

Fig. 8 (Case 30).—August 5, ninety days after extension. Right femur, anterior (*a*) and lateral (*b*) views. Wound healed; there was no sequestration.

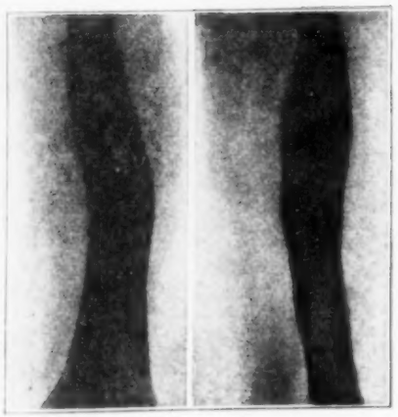

Fig. 9 (Case 30).—Feb. 3, 1916. Right femur, anterior (*a*) and lateral (*b*) views.

Fig. 10 (Case 30).—May 28, 1915. Left femur, anterior (*a*) and lateral (*b*) views.

Fig. 11 (Case 30).—June 7. Left femur, anterior (*a*) and lateral (*b*) views.

2. Fauntleroy, A. M.: Medico-Military Experiences of the European War, 1915.

ture, and a plaster cast immobilized the comminuted fracture of the leg. The knee joint was passively exercised several times a day (G. O., Case 28, City Hospital, B. I., service of Dr. H. D. Collins, Sept. 19, 1914).

4. *In fractures of several weeks' standing with much shortening,* nail extension or open operation constitute the only means by which reduction of fragments may be accomplished. Eight of my own cases belong in this class. Nails were inserted as late as twenty-one days after fracture and often after fourteen days. Previously, for some reason or another, the proper routine treatment had not been carried out, and the patients were seen for the first time (on their admission to the hospital) with shortenings of from 1½ to 3 inches.

Fig. 12 (Case 30).—August 5. Left femur, anterior (*a*) and lateral (*b*) views.

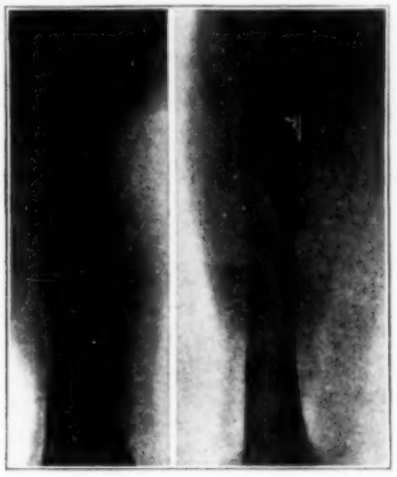

Fig. 13 (Case 30).—Feb. 3, 1916. Left femur, anterior (*a*) and lateral (*b*) views.

Fig. 14 (Case 30).—June 1, 1916. Good function; no limp; right femur shows one-half inch lengthening.

In addition to the extremely effective and relatively comfortable traction, the daily passive motion of the knee joint (in supracondylar insertions) has been a great advantage. Steinmann also recommends daily massage of the fractured thigh after the first week, but I have not been in a position to give this a trial.

Fig. 15 (Case 23).—Feb. 21, 1914. Fracture of the lower third of the right femur, anterior (*a*) and lateral (*b*) views (nail through tibia).

The favorable results in this group are so well known that illustrative case histories are superfluous.

5. *Old Malunions.* Heretofore anything like complete correction of shortening has been impossible. When such malunions were exposed at operation, the upper end of the lower fragment was found so friable that no screw or other fixation contrivance could find any hold—the bone could be pared like cheese; moreover, the longstanding contraction of the soft parts made complete reduction impossible. The surgeon was therefore obliged to content himself with partial resection of both ends and alinement of the fragments; shortening was inevitable. Now, with nail extension at his disposal, the surgeon can reestablish the fracture by chiseling the fragments apart, saving every bit of the friable lower fragment. He then can close the wound and apply nail extension. In a few days the shortening of months is overcome. Some delay in union is to be expected; even if this goes on to nonunion, it can be remedied by bone grafting with reasonable probability of ultimate success.

CASE 29.—G. H., a boy of 13, sustained a fracture of the middle third of the right femur, Nov. 5, 1914, for which he was treated at another hospital.

February 27, 1915 (three and one-half months later), he was admitted to Mount Sinai Hospital (Service of Dr. Elsberg) with a firm union and a shortening of 2¼ inches (Fig. 19).

March 5, (four months after fracture), he was subjected to operation. This consisted in (*a*) insertion of a nail in the supracondylar position by myself and (*b*) osteotomy for malunion by Dr. W. M. Brickner. The contracted soft tissues resisted reduction of the overlapped fragments even after the division of the cicatricial tissue in the soft parts adjacent to the site of fracture. The wound was closed in layers. Traction was begun with 14 pounds; within five days this was gradually increased to 23 pounds.

March 22 (seventeen days later), there was no shortening (Fig. 20).

April 3 (twenty-nine days after operation), a cast was applied with Hackenbruch distraction clamps incorporated in the plaster; ample fenestrae were left around the projecting nail ends.

Fig. 16 (Case 23).—March 28, 1914. Anterior (*a*) and lateral (*b*) views.

April 7 (thirty-three days after operation), the cast was divided opposite to the point of fracture and the halves were distracted by the Hackenbruch turnbuckles until the nail remained immovable when traction was relaxed (for there was still no union in spite of a good callus).

April 9: Figure 21 shows the distracted halves of the plaster cast maintaining reduction of the fragments.

April 28 (fifty-four days after operation), the cast was removed; there was a large callus, and union was good in a satisfactory position (Fig. 22).

May 11, the patient was sent home in an ambulant splint. There was no shortening or angulation.

For over eight weeks after this the patient failed to report at the hospital in spite of repeated requests and notices. Finally under threat of coercion by the Gerry society, the boy's parents brought him for inspection, July 8. There was considerable angulation with consequent shortening (Fig. 23). Operative correction of the deformity was flatly refused. The child was accordingly sent to an orthopedic hospital in the country to insure his being under constant competent supervision. Here he remained under the care of Dr. C. L. Wallace for six months.

Fig. 17 (Case 23).—Feb. 21, 1914. Fracture of both bones of the leg, anterior (*a*) and lateral (*b*) views.

A roentgenogram taken ten months after operation (Jan. 21, 1916) shows sound bony union with no increase in deformity (Fig. 24).

June 5, 1916, one and one quarter years after operation, there was good function (no limp), some deformity and one-half inch shortening (Fig. 25). Needless to say, had he remained under constant supervision (as instructed), angulation could in all probability have been avoided.

Objections which have been raised against the method are:

1. *Pain.*—If the skin of the thigh is pulled upward while the nail is being inserted, there should be no pain after the nail is once in place, firmly embedded in the bone. On the other hand, if the skin is not pulled upward during the insertion, later when traction is applied, the nail presses against the skin just below it, there is constant pain, and a decubitus results.

Fig. 19 (Case 29).—Malunion of right femur four months after fracture; anterior (*a*) and lateral (*b*) views; 2¼ inches' shortening.

Fig. 20 (Case 29).—March 22, 1915, after seventeen days of nail extension following osteotomy reestablishing the fracture.

2. *Infection.*—The danger of infection is nil, provided: (*a*) the strictest asepsis is observed, and (*b*) Steinmann's precepts regarding sites of insertion are followed. These are: (*a*) avoidance of the hematoma around the fracture[3]; (*b*) avoidance of the marrow cavity; (*c*) avoidance of the joint cavity, and (*d*) avoidance of the epiphyseal line. According to these tenets, therefore, in fractures above the lower third of the femur, the nail is inserted at a point 1 finger's breadth above the upper margins of the condyles just behind the middle line of the bone (Figs. 4, 7, 11 and 20). In fractures of the lower third, the site of insertion is a point on the tibia 2½ fingers' breadths below the upper margin of the tibia on a level with the lower margin of the head of the fibula (Fig. 1). In fractures of both bones of the leg in its upper half, the nail transfixes the tibia 2 fingers' breadths above the ankle joint, or 3 fingers' breadths above the malleoli. Lastly, in fractures of both bones just above the ankle, the nail point perforates the calcaneus 1½ fingers' breadths below and behind the malleoli (Fig. 18).

Fig. 18 (Case 25).—March 5, 1914. Anterior (*a*) and lateral (*b*) views. Note location of nail in calcaneus.

The few infections which I have observed have followed either lack of asepsis, or attempts to improve on the original method. Steinmann uses a sharp-pointed nail which is driven through skin, subcutaneous soft parts and bone, and is then left in situ. In the forepart of his book, written in 1912, Steinmann[4] expressly condemns incision of the soft parts so as to expose the bone; he also deprecates drilling a hole first and later inserting the nail into it. In spite of his warnings that such unnecessary procedures increase the chances of infection, and, indeed, have been followed by local infections, certain surgeons in this country have repeated the errors of their European colleagues and, I understand, their patients have suffered from bone sinuses in consequence. I therefore advise any prospective inventor to peruse the beginning of Steinmann's monograph, not only for the purpose of discovering the various modifications which have already been devised, but also to learn the defects of these questionable improvements.

Fig. 21 (Case 29).—April 9, thirty-five days after operation. Delayed union; reduction of fragments maintained by distracting halves of plaster cast with Hackenbruch's turnbuckles (the cast was cut across at the level of the fracture). Anterior (*a*) and lateral (*b*) views.

3. The only deaths attributable to the nail extension have followed infection of the fracture hematoma from the improperly placed nail tract passing through it (Steinmann).

4. Steinmann: Nagelextension der Knochenbrüche, Neue deutsch. Chir., 1912, i (Steinmann is an assistant of Kocher's in Berne).

In my own series (thirty cases) the nail holes through tibia or calcaneus were as dry on the day of removal as when they were made. The same was true of most of the femur cases; in quite a number of the remainder a drop or two of pus was present around the nail at the time of with-

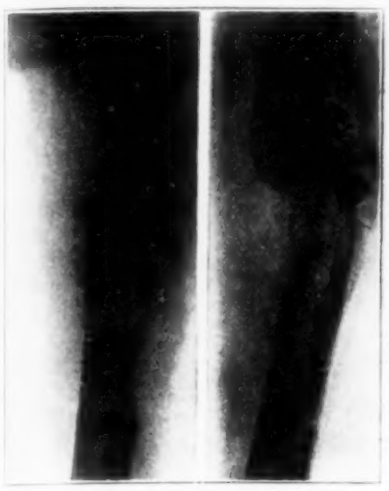

Fig. 22 (Case 29).—April 28, fifty-four days after operation. No shortening; no angulation; a massive callus. Anterior (*a*) and lateral (*b*) views. Patient was sent home shortly after (May 11) in an ambulant splint.

Fig. 23 (Case 29).—July 8, 1916, one hundred and twenty-fifth day after operation. Patient had absented himself from the clinic for more than eight weeks in spite of repeated instructions to report for observation and control. Both anterior (*a*) and lateral (*b*) bowing had taken place. The parents refused permission for any operative attempts at correction, but consented to a prolonged stay in a convalescent orthopedic hospital in the country.

drawal there had been no fever previously, there was no inflammation of adjacent soft parts at the time and the holes healed completely under the customary wet dressings in a week or ten days.

The only case of my personal series with infection resulting in prolonged suppuration and a persistent bone sinus followed displacement of occluding dressings. There was perfect function of knee and no shortening.

I have never seen an infection follow the withdrawal of the iodin-painted nail point through the nail tract, and lay no stress on the theoretical objections raised about this procedure. The metal of the nail and the adjacent skin must be thoroughly cleansed of crusts or dried collodion, and well impregnated with iodin before extraction. Afterward tincture of iodin is injected into the nail tract from both sides, and an aseptic wet dressing is applied. This is changed daily under the strictest asepsis until the holes are filled with granulation tissue; then they are covered with a mercurial ointment dressing until healing is completed.

Lastly, I do *not* advocate nail extension as a routine method of treating fractures. However, there can be no question about its being a most valuable addition to the older, well recognized procedures.

Fig. 25 (Case 29).—June 1, 1916. Good function; moderate angular deformity; one-half inch shortening.

CONCLUSIONS

1. Nail extension is a safe measure, provided the proper technic is employed.

2. Because of its small site of attachment, it is of great value in recent simple fractures with extensive abrasions, in recent compound fractures with much destruction of soft parts, and in multiple fractures of the same limb.

3. Because of its efficient traction, in conjunction with osteotomy, it is the only method whereby the shortening present in certain old malunions can be safely overcome even months after the original fracture.

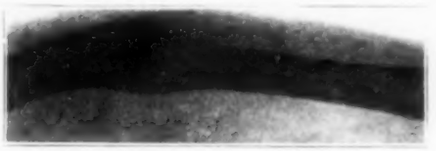

Fig. 24 (Case 29).—Jan. 21, 1916. Anterior view, six months later; firm bony union; one-half inch shortening.

4. In relation to open operative reduction, it may be stated that in certain cases nail extension will obviate the necessity for operative intervention, and in other cases it can be employed to prevent shortening until the suitable time for plating has arrived.

34 East Seventy-Fifth Street.

Industrial Poisons.—The mode of entrance into the system of an industrial poison differs with the character of the poison as well as the form in which it appears, i. e., whether as a dust or gas or fume. Some poisons are absorbed through the unbroken skin; most of them are absorbed through the digestive organs either by swallowing the poisonous dust or by getting the poisonous dust and particles through food contaminated with poisonous materials and dust. Others affect the organism by inhalation of the gases and fumes. According to Teleky, Kurschmann and other German scientists, lead is never absorbed through the unbroken skin. On the other hand, it has been shown that certain drugs applied to the skin produced the effect of these poisons. This is especially the case with mercury and other drugs. The mode of entrance may differ not only according to each poisonous element, but also according to the individual susceptibility of the worker. The season of the year is also said to have an influence on the effect of lead; and lead poisoning is said to be more serious in winter than in summer. Professor Thompson quotes Laureck, who claims that 71 per cent. of cases arise in winter and 29 per cent. in summer in Austria. On the other hand, he cites several French authors, who claim that in France lead poisoning is twice as common in summer as in the other seasons. The claim is also made that chewing tobacco leads to lead poisoning because of its liability to be contaminated with lead.—George M. Price, M.D., The Modern Factory, 1914.

NAILS AND SCREWS THROUGH JOINT SURFACES, IN AUTOGRAFTS AND IN FRACTURES INTO JOINTS*

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Last year, before the Western Surgical Association, I reported a series of experiments to determine the response of the tissues of the joints to nails and screws inserted through the joint surfaces. The present series was undertaken to find out what this response would be in the presence of autografts in the joints and of fractures into the joints.

Fig. 1.—Fracture; screw projected slightly; three months five days after operation, condyle built up, screw covered. Patellar groove lined with cartilage.

Various degrees of detachment of the fragments, from partial separation and separation from all but one crucial ligament, to the free autograft were used. The results were uniformly successful in all cases in which the pieces of bone were fastened firmly, and in all cases in which they were fixed in a faulty position and not quite securely. Only one case failed to show an apparently perfect result, with free, smooth motion of the knees, with the dogs running and jumping about so well that they had to be caught and the legs examined before one could tell which leg had been operated on. This dog was one of the autograft cases in which the graft had been fastened with a small, round brad, so loosely that the condyle could be moved rather easily in a swivel arc about the brad. It was not able to catch up its new blood supply and the entire graft of the condyle of the femur was absorbed, as was also some of the opposing surface of the tibia which had not been touched by the operation. These irregular surfaces were already covered over with connective tissue which looked like cartilage, at the end of two months, the time of the experiment.

In all, twelve dogs were used. No joint in this series or in the series reported last year showed infection, though the simple iodin sterilization, and no dressings was used in all. The time varied from one month and thirteen days to three months and five days from operation to the recovery of the specimens. The fixation of the fragments varied from firm to loose, and they were set in positions varying from accurate to one of moderate displacement. The nails and screws were set at different levels, some projecting, some flush with the cartilage, and some buried.

The results were surprisingly good. All fragments, except the loose one spoken of above, were firmly united to the femurs. The autografts were united with a callus as firm and thin as were the ordinary fractures, and the grafts themselves apparently remained as living pieces, of full size, and covered with their normal cartilage. The microscopic sections, however, show that their trabeculae are being replaced cell by cell by new bone growing inward from their vascular margins, and that the cartilage continues to live. The nails and screws in the autografts were covered, or nearly covered, with new connective tissue looking like cartilage. This was true, also, in the partially detached fracture cases. In the latter specimens some of the nails and screws had been left projecting above the surface somewhat, and, in these, the groove which they had cut in the patella was covered with new cartilage.

A remarkable tendency was shown in the condyle, in these cases, to grow until the surface tended to equal or to exceed the level of the projecting nail or screw and thus to prevent any further injury to the joints. At the same time the opposing groove shows a tendency to build up somewhat, though not to the normal level.

REPORT OF EXPERIMENTS

Experiment 1 (906).—Right knee, three months, five days after operation (Figs. 1 and 2). Knee opened inside, after a fracture had been made with a chisel, through a separate linear incision at or near epiphyseal line. Considerable amount of hemorrhage was found in the joint from the fracture.

A 1¼ inch screw was used through inner condyle into shaft of femur, the external half of which projected just above the cartilage surface, and its posterior edge was a short half millimeter above cartilage surface. The internal half of screw was sunk very slightly below surface level; joint was freely swung before suturing to cut the groove in the patella, and three layers of interrupted linen were used.

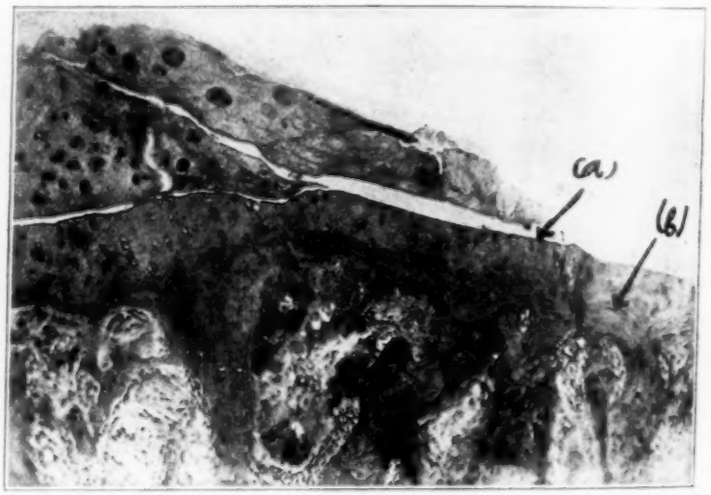

Fig. 2.—Patellar groove lined with cartilage (*a*) and filling up with bone (*b*).

The specimen (Fig. 1) shows firm union with a little excess of callus; condyle built up over the level of the screw head; screw covered; fibrous band of adhesions from tissue over screw head to synovial sheath just below patella; no signs of the blood left in the joint.

Broad groove on patellar surface, scratched by screw head, is fairly smooth, with a lining of cartilage. Cartilage surface on femur is remodeled somewhat to fit the new con-

* Because of lack of space, this article is abbreviated in The Journal. The complete article appears in the Transactions of the Section and in the author's reprints.

* Read before the Section on Surgery, General and Abdominal, at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

tour of the patellar surface, apparently largely by upbuilding.

Transverse section, Figure 2, through the groove on the patellar surface, shows cartilage even in the thinnest portions with new bone building up into it, continuous with the bone below, and, in spots, almost to the outer surface of the cartilage, that is, the groove is building up as the screw head is withdrawn from contact by the building up of the condyle.

EXPERIMENT 2 (908).—Left knee, three months, four days after operation (Figs. 3, 4 and 5). Left hind leg broken at or near epiphyseal line by a chisel; same as in Experiment 1, except the fracture was more free, and apparently left

Fig. 3.—Fracture; screw projected 0.8 mm.; three months, four days after operation, condyle built up, screw covered except slight streak at outer edge, patellar groove lined with cartilage.

attached only to small amount of periosteum. It was freely movable in all directions.

A 1½ inch screw was used through the surface under the patella, buried at its lower edge 2 mm. into the bone. On the anterior edge it projected about 0.8 mm., but before it was quite sunk to this level, the joint was freely moved so that the screw head cut a groove in the patella. These fragments of bone and cartilage were largely left in the joint. The screw held the fracture fairly well in place; it allowed a fair amount of rotary motion, judged not sufficient to spoil the experiment; a second screw was not inserted, because of the relative size of screw now in joint.

Joint filled with hemorrhage from fracture. Wounds sutured as before in three layers over joint, two over site of fracture. Linen used.

The specimen (Fig. 3) shows firm union in slight displacement; few signs of the bone chips remain; no signs of the blood left in the joint.

Growth of the condyle has raised the surface to the level of the screw margin; screw head almost entirely covered with connective tissue looking like cartilage, all except a slight streak at the edge.

Patellar surface, broad smooth groove cut by screw head fairly evenly lined with cartilage.

Transverse section through patellar groove (Fig. 4) shows bone growing upward into the cartilage, and in many places farther along, it has come to the surface in its endeavor to fill up the groove as the screw head was withdrawn by the building up of the condyle.

Transverse section through the tissue covering the screw (Fig. 5) shows connective tissue, a reversion of the cartilage to connective tissue over connective tissue derived from the bone spaces.

EXPERIMENT 3 (911).—Left knee, two months, fifteen days after operation (Fig. 6). Knee fractured with chisels, through longitudinal incision. The line of fracture went through upper surface of articular cartilage, over which the patella moves; fragment was made free from all periosteum, though still attached to some of the ligamentous tissues throughout part of its circumference. Joint opened along inside of patella, which was dislocated outward; fragment fastened into place with two furniture nails, the inner one buried 2 mm. at shallowest point, 3 mm. at lower edge, on account of oblique surface of joint. The other nail was buried 1.5 mm. at lower edge and about flush with cartilage surface at upper edge. Joint closed with three layers of linen.

There was a considerable amount of blood left in the joint. Specimen (Fig. 6) shows firm union with slight displacement, noticeable only at the cartilage line; slight growth of connective tissue fastened to the cartilage at this line.

Anterior nail, covered with connective tissue and nearly smooth; posterior nail, nearly covered with connective tissue; condyle has built up somewhat so that the edge of the outer nail is now below its surface.

Patellar groove is lined with cartilage, but shows that the nail opposite used to project somewhat.

Section transversely through the groove on the patella (Fig. 6) shows cartilage growing, with bone formation beneath, to lessen the groove.

EXPERIMENT 4 (913).—Left knee, two months, six days after operation (Fig. 7). Left knee opened as before. Fracture made ⅝ inch lower than upper edge of the articular surface with a flap of cartilage and bone, averaging 1 to 3 mm. in thickness and on the surface of a full ¼ inch, loosened from surface of fragment; the lower fragment entirely separated from periosteum, but attached to soft parts, throughout part of its circumference. This was fastened by two furniture nails driven through the surface under the patella, but not quite in perfect line; the outer nail very slightly below the joint surface. The inner nail projects 1 mm. above the joint surface.

Three layers of sutures; moderate amount of blood in joint. Joint moved up and down to make necessary groove on the patella to correspond with the projection of the inside nail.

Specimen (Fig. 7) shows firm union; partial absorption of the small flapping fragment; condyle apparently slightly built up to decrease the elevation of the nail and its surface changed to accommodate itself to the changed groove scratched in the patella. Patellar groove not yet covered with cartilage. Otherwise, joint surface smooth.

Transverse section through patellar groove shows bone growing so rapidly to fill up the groove that there is almost no cartilage over it.

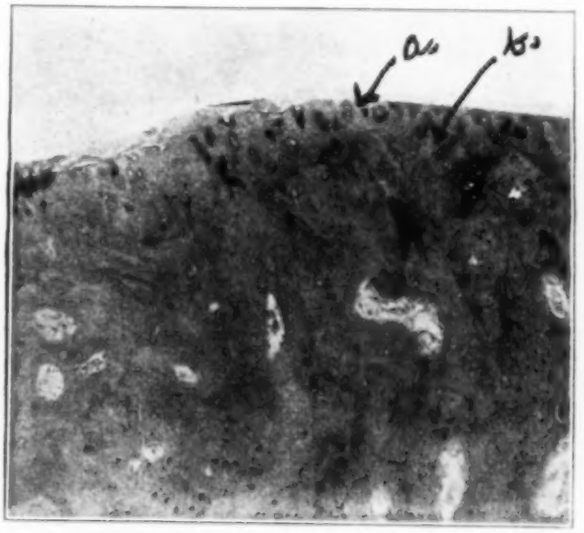

Fig. 4.—Patellar groove lined with cartilage (*a*) and filling in with bone (*b*).

EXPERIMENT 5 (916).—Left knee, two months, one day after operation (Fig. 8). Left knee opened as before; fracture a little over ½ inch below edge of cartilage; periosteum completely severed. Two nails were inserted; the inner nail head buried well into the bone under cartilage surface 3 mm. deep; the outer nail head buried 2 mm. Fragment rotated inward before fastening.

Suture; three tiers, sutured as before. Considerable blood was left in the joint.

Specimen (Fig. 8) shows firm union in its new position. Nails completely covered with connective tissue, nearly

smooth; opposing surface smooth; no signs of the blood left in the joint.

Experiment 6 (924).—Left knee, two months, twenty days after operation (Figs. 9 and 10). Incision over internal aspect of left knee anteriorly; internal condyle fractured with a chisel and entirely loosened from surrounding tissue, so that it was held only by one crucial ligament alone for its blood supply. This was rotated outside of the joint to make sure; on returning to place, there was a persistent tendency toward internal rotation of the posterior portion, so that it was difficult to place it in correct position, though this could be done.

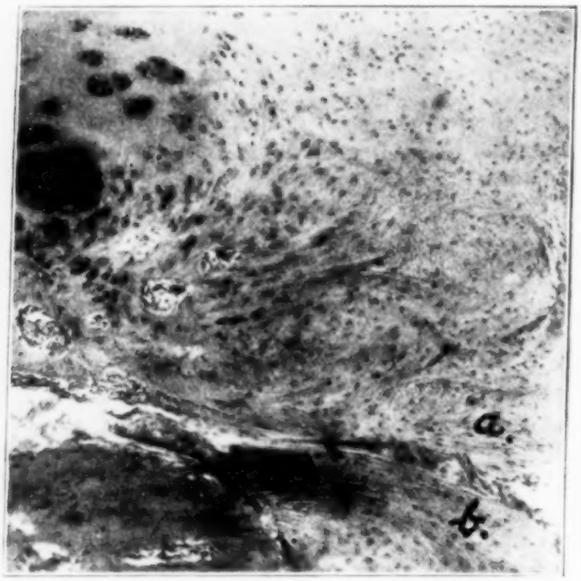

Fig. 5.—Tissue covering screw; a reversion of cartilage to hyaline cartilage and then to connective tissue (*a*) overlaying connective tissue derived from the spaces between trabeculae (*b*).

The fragment was fastened by one furniture nail through articular surface slightly above the cartilage, with moderate tipping of the whole fragment, so that the lower surface was bent farther from the middle line of joint than normal; this apparently held fragment fairly firm in position. The cartilage surface which had been cut across was matched at the inner anterior margin, but the twist left the outer anterior margin (mesially) projecting about 2 mm. above corresponding cartilage of upper fragment and at a distance of 1 mm. from it. The nail head was left just above cartilage level posteriorly, but only very slightly.

The joint was sutured in three layers, interrupted linen sutures; moderate amount of blood left in joint.

Specimen (Fig. 9) shows firm union in its new position of slight rotation with a fine line showing in the cartilage. The projecting edge of the fragment under the patella is smoothed down to fit the patellar surface, but is covered with cartilage.

The nail is completely covered with a thin layer of connective tissue, nearly smooth.

Transverse section through condyle and line of union shows the line of union complete, but cartilage edge of the union shows fibrocartilage.

The fragment (Fig. 10) has behaved like an autograft, and shows microscopic replacement of the bone trabeculae taking place at all margins. Bone cells in the centers of the trabeculae are gone, the cell spaces empty. This is a little more noticeable as the distance increases from the line of union. This corresponds with the microscopic regeneration of the autografts. The circulation through the crucial ligament has been insufficient to keep the fragment living.

The articular cartilage has kept its vitality and has undergone no apparent change, except that in some places, and to a moderate degree, it seems to contribute to the microscopic replacement of new bone in some of the trabeculae nearby.

There is the tendency toward the formation of fibrocartilage in a vertical arrangement at the line of union. The bone of the line of union is nearly indistinguishable from that of the bone of the shaft near it.

Experiment 7 (926).—Left knee, autograft of condyle, two months, one day after operation (Figs. 11 and 12 *d*). Left knee was opened as usual; external condyle chiseled free from bone and separated from crucial ligament and all the soft tissue, and finally removed from the joint to be sure that it was a free autograft, then fastened into place by two furniture nails, so that the upper edge of each nail is buried 1 mm., the lower edge 2.5 to 3 mm., below the cartilage surface. Apposition at line of fracture good, but condyle slightly rotated; fair amount of blood in joint. Joint sutured in three layers as before; linen sutures.

Autograft (Fig. 11) shows perfect union in its new position of slight rotation; apparent living of entire autograft; cartilage surface smooth and normal; no atrophy of condyle; nails covered; crucial ligament not united.

The roentgenogram (Fig. 12 *d*) shows autograft, nails and line of union.

Transverse section (Fig. 13) shows microscopic growth of new bone replacing the bone trabeculae in the autograft, taking place at practically all margins from the vascular spaces inward. Bone cells in the centers of the trabeculae are gone and the cell spaces are empty. The general contour of the trabeculae are preserved by the new growth. There is no open space between the new and the old.

The articular cartilage remains practically unchanged, except that in places it seems to contribute to a small degree to the replacement of new bone in some of the adjoining trabeculae. At the line of union there is a tendency toward fibrocartilage with a vertical arrangement.

Experiment 8 (928).—Left knee; autograft, two months, four days from operation (Figs. 14 and 12 *a*). Left joint opened as before; two holes drilled before internal condyle was broken off with a chisel, and removed from joint after separating the crucial ligament (that is, a free graft). The fragment was replaced; two furniture nails driven so that the edges toward median line of knee were very slightly below cartilage level, though almost of the level, the outer edge deeper.

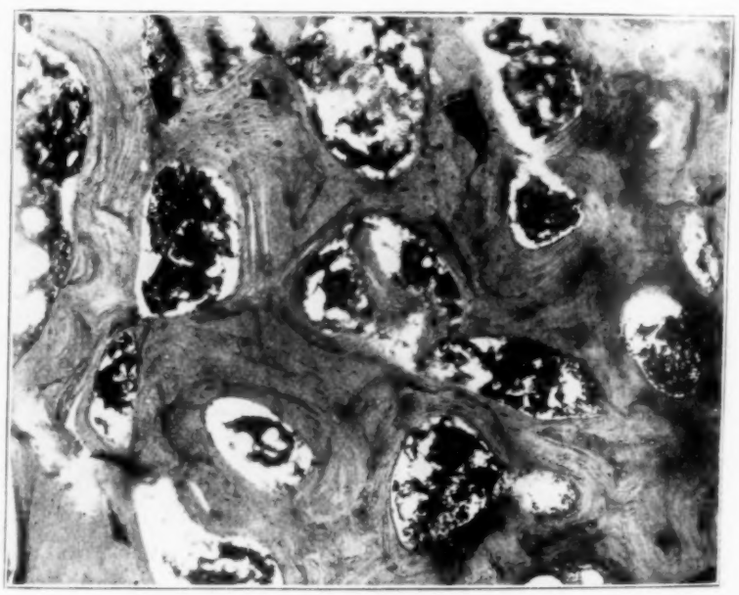

Fig. 10.—Transverse section through fragment; high power; condyle has united like an autograft, with microscopic replacement of bone.

Joint full of blood when sutured in the usual way. Position of fragment almost exactly normal.

Autograft (Fig. 14) shows perfect union, so smooth that a faint line can just be made out on the cartilage; entire graft apparently has lived.

Anterior nail covered; posterior nail nearly covered, all but one edge; no evidence of the old blood in the joint; cartilage on the opposing tibial surface nearly smooth, not quite; semilunars normal; crucial ligament not united.

Fig. 14.—Free autograft of condyle; two nails; two months, one day after operation, perfect union, no atrophy of condyle, crucial ligament not united.

The roentgenogram (Fig. 12 *a*) shows autograft, nails, and line of union.

Transverse section through autograft and line of union (Fig. 15) shows the microscopic replacement of the bone trabeculae in the autograft from the vascular spaces at practically all margins, with the bone cells in the centers gone and the spaces empty; the general contours of the trabeculae preserved; almost no distinction between the trabeculae in the line of union and the living bone attached to the shaft; the semilunar cartilage practically unchanged except that it contributes somewhat to the new bone formation. At the line of union there is a change toward fibrocartilage with a tendency toward vertical arrangement.

EXPERIMENT 9 (933).—Left knee; autograft, empty drill hole, two months, seven days from operation (Figs. 16, 12 *c* and 17). Incision into left knee as before; drill hole with countersinking for screw; a second drill hole was made anteriorly with the countersinking and left open; fracture of internal condyle, which was removed from joint to be sure that it was a free graft; screw inserted after replacing the fragment. Line of union excellent, a small partially detached fragment was left on posterior portion of bone graft; joint sutured as before.

The screw head was just above level with the cartilage surface toward middle of joint; it cleared about 2 mm. at opposite edge.

Autograft (Fig. 16) shows perfect union, no atrophy; cartilage smooth; entire graft apparently has lived; the loose tag of the fragment has also smoothly healed in place; screw, outer portion more than half covered with new tissue.

Opposing joint surfaces are smooth and normal except a slight loss of the semilunar surface now healed over. The empty hole is entirely filled with new tissue.

The roentgenogram (Fig. 12 *c*) shows autograft, screw and line of union.

Section (Fig. 17) is through autograft and line of union, and includes the filled hole. This shows the microscopic replacement of the trabeculae in the autograft as in the preceding specimens and the same unchanged condition of the cartilage with its moderate contribution to the new bone formation and its tendency toward fibrocartilage in vertical arrangement at the line of fracture.

The hole has been filled apparently by growth from the living bone below, very little from the bone and cartilage in the autograft. It is covered with connective tissue, the upper layer from hyaline cartilage changed through fibrocartilage to connective tissue, the lower layers from the connective tissue growing out from the vascular bone spaces.

EXPERIMENT 10 (935).—Left knee; autograft, filled hole; two months after operation (Figs. 18 and 19). Left knee joint was opened as usual; two holes drilled and the internal condyle chiseled off and separated from all soft tissue, including the crucial ligament, removed from the joint and replaced. The joint was small; there was considerable difficulty in getting the fragment perfectly true; a screw hole with countersunk margin was left open; a second opening for a nail made and a small brad inserted; fragment in excellent position and apparently stayed in place moderately on manipulation, but easily moves in a swivel arc about the brad. Head of nail sunk well below surface of cartilage. Joint full of blood when closed.

The specimen (Fig. 18) shows that the loose autograft has entirely disappeared. The surface left is pitted and irregular. Evidently there has been a definite osteoclasis sinking it below its original level. Two small spicules project from its surface. These and the remaining surface are covered with connective tissue which looks like cartilage. The opposing tibial surface is likewise partly absorbed and pitted, but covered with modified cartilage. Part of the semilunar cartilage on the opposing surface of the tibia is absorbed, leaving only fragmentary portions still in place. A small area on the other condyle also shows irregular absorption, but here the semilunar cartilage is intact.

The patellar surface shows some absorption with fairly smooth upbuilding of modified cartilage of a slightly changed color.

Section through the irregular surface of the femoral condyle shows some microscopic destruction with osteoclasts and Howship's lacunae, with here and there some new bone growth. This area is covered with connective tissue, derived in part from the cartilage by reversion through fibrocartilage to connective tissue and in part from the connective tissue of the bone spaces.

Figure 19 shows the cartilage changing toward new bone in one direction and toward connective tissue in the other.

The section through the tibial surface shows similar changes,

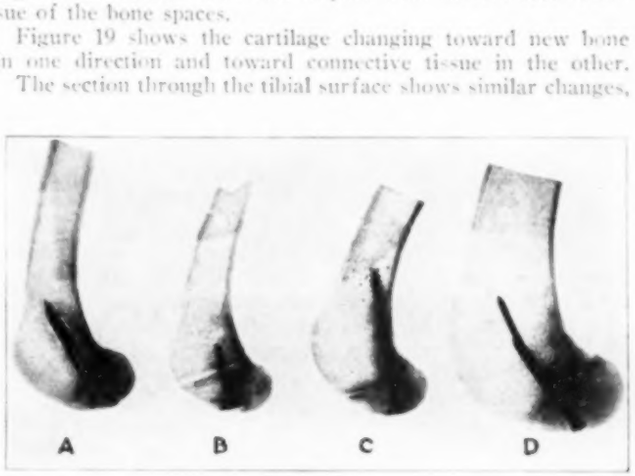

Fig. 12.—*a*, autograft, nails and line of union; *b*, fracture, screw and line of union; *c*, autograft, screw and line of union; *d*, autograft, nails and line of union.

though the osteoclasts here seem to be mostly single cells, while in the femur there are more which suggest the multinuclear type, and the connective tissue covering is thinner in places and in spots the surface is bare.

EXPERIMENT 11 (937).—Left knee; one crucial ligament attachment, empty drill hole; one month, thirteen days after operation (Fig. 20). Left knee joint entered as before; two screw holes with countersinking for the screw heads; lower hole left open, anterior one used for screw, after separation of internal condyle from all tissue, except the crucial ligament, which was left attached. One screw holds the condyle firmly, but in a position of moderate rotation, inward, of the

posterior portion (that is, away from joint center), leaving a wedge-shaped fissure on the joint surface beneath the patella. Joint sutured as before, three layers.

The screw head lies nearly flush with cartilage of joint, in its upper and inner half, buried 3 mm. in its outer edge (that is, away from joint center) just below the transverse line of screw head. Joint fairly full of blood when closed.

Specimen (Fig. 20) shows the fragment united like a free autograft. There is firm union in the position it was fastened, that is, in slight rotation; fracture line still moderately irregular; cartilage smooth; no absorption of condyle; screw head over half covered with new tissue; no overbuilding of the condyle, as the anterior edge of the screw is still about flush with the cartilage surface.

Fig. 14.—Free autograft of condyle; two nails; two months, four days after operation, perfect union, anterior nail covered, posterior nail nearly so, crucial ligament not united.

Semilunar cartilage opposite the screw on the anterior edge shows some fibrillation and a moderate loss of surface where the screw evidently rubbed it.

The empty screw hole is filled though not quite smooth, and is apparently covered with the same sort of tissue as the screw head. There is no evidence of the blood left in the joint.

Section of the condyle, the line of union and the filled hole show the same microscopic replacement of the trabeculae. The circulation through the crucial ligament is so minute that, with this attachment alone, the condyle unites like a free autograft. The hole has been filled largely by bone from the shaft fragment from below, with very little from the detached condyle, and the covering is connective tissue, a reversion of the hyaline cartilage to the connective tissue type over connective tissue growing from the vascular spaces.

Experiment 12 (942).—Left knee, one month, twenty-five days from operation (Figs. 21 and 12 *b*). Left knee opened as before; chisel fracture, both condyles in one piece, about 1 inch back of anterior edge of cartilage; one ordinary drill hole ¾ inch deep anteriorly, not entirely through the fragment on internal condyle, was left empty, as a blind pocket; one ¾ inch screw used to fasten fragment in place.

Fragment came into good position, except a separation of nearly 2 mm. along the inner line of fracture, where chisel had been inserted, a distance of about ¾ inch in length; approximation along cartilage under patella quite good. Joint full of blood when sewed with three layers of sutures in the usual way.

Specimen (Fig. 21) shows firm union with a fine line; empty hole filled; screw three quarters covered over with connective tissue.

The roentgenogram (Fig. 12 *b*) shows fragment, screw and line of union.

Section (Fig. 21) through filled hole, condyle and line of union shows that the trabeculae in the condyle have lived; new trabeculae in the line of union formed from both fragments. The small empty hole has filled with bone, largely from the loose fragment, which is almost indistinguishable from the surrounding bone, and because small, is covered with cartilage, nearly all of it fibrocartilage running vertically.

REPORT OF CASES

To this series of animal experiments I wish to add two cases in the human being, one in an elbow and one in a knee. The elbow was reported with my previous series.

Case 1.—A fractured and misplaced fragment of the external condyle of the humerus in a boy of 7, persistently resisted all the usual methods of replacement, and six weeks after the fracture the fragment stood out from the joint with a rotation of nearly a half circle. The slight attachment to a small strip of the external lateral ligament suggests the experiments in which a condyle of the knee was loosened from all attachment but the crucial ligament, and which united to the shaft like a free autograft. The slight attachment apparently was sufficient to prevent its gross absorption, but no callus was found, six weeks after the injury, at the time I saw the case, opened the elbow and nailed the fragment with two small furniture nails through the joint cartilage. The joint was held in acute angle flexion at first, and, later, a few connective tissue adhesions were broken up under ether. This loosened the fragment somewhat, but the final result was a good serviceable joint with moderate limitation of motion at the extremes of motion.

Case 2.—This was a free autograft of the external condyle of the knee in a Syrian girl, aged 13, who had been knocked down by a motorcycle and run over from her feet upward. This resulted in crushing of the left foot, a fracture of both bones of the right leg, a compound fracture of the pelvis through the vagina, and a badly displaced T fracture into the left knee joint (Fig. 22). The crushing of the foot resulted in a necrosis of the little toe and most of its metatarsal; the fracture of both bones of the leg and the compound fracture of the pelvis healed nicely.

The girl was in marked shock. When this wore away she was given ether, and an attempt was made to set the T fracture into the knee. The roentgenogram, later, showed the fragments as badly out of place as before. Then in an open operation, the inner condyle was replaced and fastened with a Lane plate. Through a second incision the external condyle was felt to be loose and finally rolled out into my hand, a free autograft.

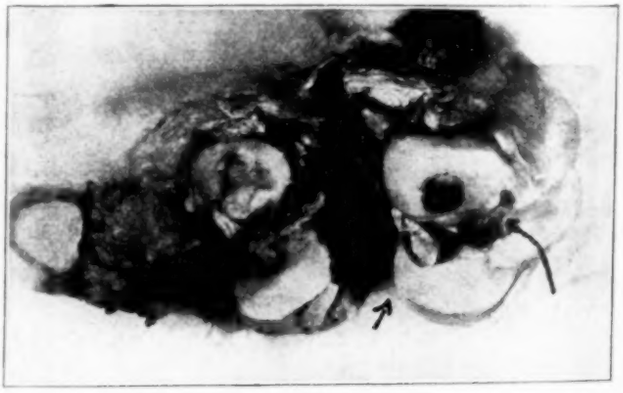

Fig. 16.—Free autograft of condyle; screw projected; drill hole left empty; two months, seven days after operation, perfect union, no atrophy, screw more than half covered, empty hole almost entirely filled.

This made a tight fit in its natural position after a few jagged edges toward the shaft side had been trimmed with bone forceps. The soft parts sewed over it fastened it so securely into place that no nails or screws were used. Owing to the original crushing of the soft parts and possibly to

some dried scabs, there was a streptococcus infection in the wound over this fragment which extended well up the thigh and gave temperatures over 103, which after a number of days slowly subsided. The discharge lessened but did not stop.

One month after the operation I determined to find out what conditions existed, and gave the patient ether, removed the cast, and explored. My fingers finally came down on a bare corner of the autograft in the lower branch of the sinus. I thought it wise to leave the graft in place, even if it came out later, as I expected it to do, so that if possible there might be some mold of new bone formed about it which might fill in later after the autograft came out. On looking the leg over I noticed a pouting sinus over the calf with a grayish slough in its opening. I pulled on this, and gradually the whole gastrocnemius muscle came out in one piece.

A few days after operation the discharge lessened, and after some time the wounds finally healed, with the graft still in place (Fig. 23).

At the end of three months from the first operation the last cast was removed (Fig. 24), and the girl is now walking with a movable knee which can be flexed almost up to her thigh. The Lane's plate is still in place. Although no nails or screws were used to fasten the free condyle into place, I have thought it proper to report the case in connection with this series of experiments which it inspired.

The remarkable thing about this case is not only that the free graft of the external condyle lived and gave a useful knee, but that it lived in the presence of an infection of a distinctly violent type and that the Lane's plate is still in place. The fissure leading to the plate must have granulated in sufficiently to have closed the plate from the field of the infection.

Fig. 17.—Transverse section through autograft, high power; microscopic replacement of trabeculae (without the preliminary formation of cartilage and without the intervention of special osteoclasts).

CONCLUSIONS

1. Free autografts unite with a line of callus as fine as those of simple fractures, with a free joint, and without adhesions.

2. The autografts seem to live, but in reality the bone trabeculae are gradually replaced by microscopic bone growing inward from the vascular spaces between them, while the cartilage continues to live and to a limited extent aids in the formation of the new bone adjacent to it.

3. The main replacement of the bone in the trabeculae seems to take place directly from bone cells without the preliminary formation of cartilage, and the dead portions of the trabeculae seem to be absorbed in a line immediately adjacent to the new growing bone without the intervention of special osteoclasts.

4. Condyles detached from all tissue save the crucial ligament unite like free autografts.

5. Condyles, attached more or less to other tissues as well, continue to live throughout, or nearly so.

6. Nails and screws are tolerated in the human being as well as in the experimental cases, and with surprisingly little reaction. They remained firmly embedded in every specimen recovered, but the Roentgen ray shows a slight thinning of the bone about them.

7. The surface covers with connective tissue, a reversion of the cartilage from hyaline to fibrocartilage and then to connective tissue, which overlays connective tissue derived from the vascular spaces between the trabeculae.

8. The response of the condyles to the presence of a rigid body projecting above the joint surface is to build up the condyle in its attempt to withdraw it, and prevent further injury to the opposing joint surface. This also takes place when the condyle is an autograft.

9. This growth is a true growth of bone, and the cartilage tends to retain its normal thickness.

10. The groove cut by a projecting nail or screw, in the opposing surface, covers over with hyaline cartilage, and the groove tends to fill up with bone as the projecting body is withdrawn by the growth of the condyle.

11. The line of fracture in the cartilage tends to cover over with cartilage, largely of the fibrocartilage type if it is narrow, with connective tissue if it is wide.

12. In autografts, empty drill holes fill with new bone, growing up from below, only to a very limited degree from the bone and cartilage in the graft; in living fragments, from the trabeculae of the fragment, very little from the cartilage. The surface covers with the same kinds of connective tissue as do the nails and screws.

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ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. GERSTER AND MANN

DR. CHARLES E. THOMSON, Scranton, Pa.: Fracture of the neck of the femur is very badly treated, if, indeed, it is treated at all. We complain that the profession has introduced theories that as these patients are mostly old it would be better not to treat them. I think that many of our bad results have been brought about by two traditional fallacies, first, that the neck of the femur would not unite as other bones do, and second, that the proper thing to do with a fracture any place in the femur was to place the body on an inclined plane and hang a weight some place on the broken limb and call it Buck's extension. Buck's extension at best is a misnomer; in practice and principle it is wrong, and as generally used it is a farce. Since reading my last article before this section I have had upward of a hundred cases treated by Whitman's method and with one single exception I have obtained good functional results.

DR. R. H. SAYRE, New York: Why are these fractures in general treated so badly? It is because the medical profession does not take any interest in them. The profession is much more interested in surgery of the abdomen, surgery of the thorax, sutures of the heart, and odds and ends of that kind instead of common things like fractures. It seems to me that with the coming of the Workman's Compensation

Act a great deal more attention will have to be paid to fractures if we expect to escape malpractice suits. When the insurance companies have to pay the bills of these people with damaged legs instead of their being treated in hospitals for nothing they will expect a much better result than a great many of them at the present time receive, and as they wander around through eight different medical examiners and hear incidentally the opinions expressed by these eight different medical examiners as to the benefit they have derived from their treatment, they will sometimes become peevish and seek the courts.

If it is a fact that we can drive tacks and brads into joints without disturbing their function, it is a wonderful thing to know. I am extremely glad to hear that we can treat joints with so much more impunity than I had supposed was possible, and I shall look for these cases with very great interest in the future. It would seem to me that that last case of the child with the supracondylar fracture might perhaps have been a good case for the use of a Steinmann needle in the shin as a means of holding the fragments in position.

In these cases which are reported by Dr. Gerster, some of which I have seen, I think that the Steinman pin has given most excellent results. There is no question but that it has a very distinct function in the treatment of fractures where you wish to make traction and hold fragments in position and yet have no suitable skin on which to make traction. I believe there are certain cases where it is a distinct aid to our present mode of treatment.

Dr. H. H. Albee, New York: I, too, was a little astonished that joints would survive metal being driven into them. In my own practice I cannot bring any experience to bear on these procedures. I have used bone graft pegs. It seems to me that it is preferable to put this metal in a position where it can be removed with little difficulty if it ever gave trouble. We must consider not only the immediate but the remote danger of infection. In reference to fractures of the neck of the femur, I would remove the bone graft from the crest of the tibia with the motor saw. We must get as perfect a fit of the graft as possible. These pegs can be made of any size and it is that type of peg that I have been using in place of the nails and screws that Dr. Mann has mentioned. The reasons we do not get union are: first, mechanics; second, faulty blood supply; third, meager osteogenesis, and fourth, the danger of an early callus formation. I would not remove the head of the femur until the last ditch has been reached. The bone graft fixes equally as well as the nail and it stimulates osteogenesis.

Fig. 24.—Cast just removed; three months; knee movable.

Dr. James T. Watkins, San Francisco: The abduction treatment of hip fractures is the application of a surgical principle to a single joint. That is, fractures about joints should be put up always in that posture which is the most difficult for that joint in health to assume. Extreme abduction is the posture which the hip in health finds most difficult to assume. That is the broad underlying principle recognized by orthopedic surgeons, and perhaps we can persuade our surgical friends to adopt this treatment.

Epiphyseal separation occurs practically invariably in children from 13 to 15 years of age, and especially in exceedingly fat children. When they come to us for examination there is a slight shortening, some outward rotation, and they cannot raise the leg to any extent.

Dr. W. R. MacAusland, Boston: In treating fractures of the long bones or about the neighborhood of joints we should remember that the human body is like a machine that works in certain fixed and irrevocable lines. As we see a fracture for the first time our first object should be to return function as soon as possible and to avoid confinement in bed; first, to prevent the atrophy from disuse; second, to enable the patient to regain function early. Dr. Whitman has outlined the principles and those who follow his advice carefully and faithfully need rarely resort to any operative interference whatsoever. In fractures of long bones alignment is most important, more from the orthopedic than the surgical standpoint. Limitations of joint motion and deformities all have after-effects which disable and make the patient inefficient. Dr. Gerster has outlined his method in the use of nail traction. My objection to it is the length of time it demands confinement in bed. Then comes the question of which way the pendulum is now swinging on the operative treatment of fractures. In the last ten years we have seen a distinct wave of operative enthusiasm in these acute fractures. We have seen the promiscuous use of bone plating and have seen disastrous results in the hands of many surgeons. Conservative treatment of fractures still is a very fertile field. Given, for example, 100 cases of fracture in our clinics there is no question that 65 to 80 per cent. can be treated and get perfect functional results by conservative treatment when followed out properly. But only in a certain percentage of cases, about 20 per cent., is operative interference indicated. I strongly oppose the use of metal in contact with bone. Some time or other it will suppurate. What are we going to use in these cases where operative interference is indicated, which is, as I said, a small percentage? The technic demands careful asepsis, avoidance of handling the skin and approaches to fracture. The cavity of the fracture can be sponged out with gauze and dried and the serrations of the fragments fitted together accurately. Then put it up in plaster. The advantage of this procedure is that there is no metal in contact with bone which will delay union, and the fracture is firmly held in an ambulant splint. These cases unite early with very little callus, the fractures healing mainly by internal and not by external callus.

Dr. Charles A. Parker, Chicago: I wish to commend the Whitman dressing for fracture of the neck of the femur. Two or three points are to be considered that have not been mentioned today. One is that there is an interference with abduction by the adductor muscles, so that the trochanter may not hit the upper part of the acetabulum. If you take the skeleton and abduct the thigh with the foot rotated outward, you rotate around the axis of the neck of the femur instead of getting true abduction. The important part of the whole treatment is to fix the bone in a good plaster cast. Rotate the foot inward as far as possible and put a plaster cast over the foot. Why does not the doctor follow the Whitman method? Because of the trouble with the plaster cast. In regard to the slipping fractures of the fat children: I may be entirely mistaken in the cases spoken of but in age and method of development, slowly developing with or without an injury, it is apparently a typical case of coxa vara adolescentium.

Dr. A. B. Fitch, Factoryville, Pa.: A patient of ours tripped on a carpet. The fracture was the same as Dr. Thomson's and he put it up after his method. I see that woman walking on the street almost every day and I think the result is perfect.

Dr. Leonard F. Schmauss, Alexandria, Ind.: We had many fractures of the neck of the femur at Cook County Hospital, Chicago; we treated them entirely with Liston's

splint, which gives excellent results in fracture of the middle and upper part of the femur. But I was frequently disgusted when the splint was removed and I saw the subluxation or stiffness of the knee joint. In thinking over the matter I came to the conclusion that the cause of the trouble was due to the *method of extension*. Take raw adhesive strips, apply them to the limb and secure them with a snug bandage and then apply the weight. Where is the traction exerted? Practically seven tenths of it on the limb below the knee. The pull is from the limb below and around the knee joint—thus causing subluxation and stiffness—instead of from above, directly and mostly on the femur, as it should be. After recognizing this principle I left on the facing of the adhesive rubber below the knee and made the straps adhere to the thigh above only, thus preventing undue traction on the knee joint and in that way had no further trouble with subluxation and stiffness. If you follow this precaution you will have less occasion to use wire nail extension.

DR. A. T. MANN, Minneapolis: This was an experimental study and I think it has brought out some exceedingly interesting things: in the ability of the joint to stand more damage than we usually think it can stand, the way the condyle fills up in response to a badly placed nail or screw, and in the way in which the replacements of autografts are made. I feel that it would seldom be necessary to place these nails and screws in the joints. Sometimes it may be a desirable thing to do. I think the experimental study shows some exceedingly interesting points.

A BACILLUS ISOLATED FROM EPILEPTICS

PRELIMINARY REPORT

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Feeling a deep interest in epilepsy, I undertook a study of individuals classified as epileptics in the East Louisiana Hospital for the Insane. It was decided that this investigation should be conducted from every possible angle. Accordingly, case histories were reviewed and relatives questioned with a view of discovering the part played by heredity, personal injuries and illnesses, and psychic factors. Accurate records were kept giving the number and description of the paroxysms in each patient, nurses were interrogated regarding the habits and disposition of the epileptics in their care, and careful physical as well as mental examinations were made. In the beginning of the work it was found that a few patients not diagnosed as epileptics on admission to the institution had developed the typical epileptic convulsions and mental characteristics, while a still fewer number classified as epileptics had later turned out to be something different. I mention this only to emphasize that such mistakes in diagnosis are liable to occur, and that it is necessary to rectify them before proceeding to the investigation of the etiology of epilepsy.

While I was in the midst of this work, Reed of Cincinnati published a paper definitely asserting that epilepsy was caused by a bacillus which might be isolated from the blood stream, which organism was found in large numbers in the colon of epileptics, and was demonstrable in the retroperitoneal glands.

That epilepsy was of toxic origin was not a new idea, in consequence of the labors of Haig, Weber, Ferrani and many others. Voison and Bra had both attempted to connect epilepsy with the presence of micro-organisms (streptococci) in the blood, the occurrence of which Besta was unable to confirm.

In view of the mass of statistical evidence pointing to the importance of the hereditary influences, and the traumatic factor, as well as the information gleaned from psychanalysis, I could not do otherwise than view with great skepticism the assertion that epilepsy was an infective process. Accordingly, the work embodied in this report was performed with the view of substantiating or disproving this assertion, and was begun with the preconceived idea that there was not any such organism as the *Bacillus epilepticus*.

MATERIAL AND TECHNIC

There are 130 epileptics in this institution. Their histories were carefully reviewed with the idea of selecting those most desirable for investigation from a bacterial standpoint. This selection was not found feasible, and in the majority of instances the patient was selected at random. When it was reported that an epileptic was having a seizure, a culture was made from his blood regardless of the etiologic factor apparently responsible for his condition.

Blood cultures were made by inoculating 100 c.c. of slightly alkaline bouillon with 2 c.c. of blood withdrawn from the median basilic vein. Two cultures were made each time from the same patient and were lettered A and B. A was examined every twenty-four hours. B was examined only after A had been declared positive or negative. This was done as a check on contamination during frequent examination. Cultures were incubated at 37.5 C. (99.5 F.). They were examined every twenty-four hours for ten days, at the end of which time, if no organism was found, the culture was declared negative.

When making smears from the blood cultures to search for the organism, it is well to agitate the flask, thus shaking up the growth, which occurs most abundantly in the bottom of the flask. I have found it even better to aspirate a small amount of the sediment from the bottom of the culture with a sterile capillary glass tube. In this way I am able to discover the organism much sooner than by any other method.

The organisms stain most satisfactorily if carbol-fuchsin is applied for one-half minute and then Loeffler's methylene blue for one minute. It stains very well, however, by any of the common laboratory methods. If it is desired to stain so as to form a marked contrast between the spores and the bacilli, any of the spore stains may be employed.

In some instances an inhibiting substance appeared in the blood cultures, and for this reason, after the cultures had been incubated for seventy-two hours, transplants were made on agar slants.

Both plain bouillon and dextrose bouillon were used; the mediums were prepared in large quantities and all were sterilizied at the same time and in the same manner. Some bouillon from each lot of medium was incubated as a control. The glass syringes were sterilized in large lots by dry heat, and one syringe from each lot was rinsed with bouillon and the rinsing incubated as a control. In no case was the sterilization found at fault.

RESULTS

Cultures were made from twenty-four epileptics during or immediately following seizures. A bacillus was isolated from 75 per cent. of these. The cultures were not found uniformly positive. At one time we would get a positive culture following a seizure, while a culture made several days later following an attack

might be negative. I wish to emphasize this fact. In one case the fourth culture was found positive, while three others made from the same patient under similar conditions were negative. As it is well known, epileptics frequently have a series of paroxysms, after which they are free of convulsions for varying lengths of time. It seems probable that the time the cultures are made in reference to whether the patients are just beginning or are recovering from their convulsive periods is a factor in isolating the organism.

Cultures were made from eighteen epileptics in whom no convulsions had occurred for several days. All of these were the same patients in whose blood I had found the organism immediately following a seizure. In only one case was the bacillus isolated during the intraconvulsive period, and this patient was seriously ill with influenza at the time the culture was made. This would lead me to conclude that when one is attempting to isolate the bacilli, cultures must be made during or immediately following the convulsion.

Cultures were repeatedly made from forty-two non-epileptics. Seven of these were sane; thirty-five were insane, all forms of insanity being represented. These were made during the same time that the cultures were made from the epileptics, the same medium and technic was employed, and the insane patients were living under the identical conditions and receiving the same food as were the epileptics. None of the controls showed the bacillus found in the epileptics, with one exception. In the beginning of the work the organism was found in a patient classified as constitutionally inferior. Seven other cultures were made from this patient, and they were all negative. At first it was thought that this patient might be a potential epileptic in whom the convulsions had not appeared. Later it was decided that a break in technic was responsible for finding the organism in the culture.

THE ORGANISM

The organism is a large, gram-negative, spore-bearing bacillus which shows a tendency to form chains. The endospore is central in location, elongated in form, and practically fills the entire bacillus when present. The spore develops in from forty-eight to seventy-two hours.

The organism grows slowly. It is not found in a blood culture under seventy-two hours after the culture is made. In all cases from three to eight days were required to secure a good growth. I believe the time required for the growth to develop is partially responsible for some observers having failed to find the organism. I would advise that no culture be considered negative until it had been incubated and observed for two weeks.

In bouillon there is a slight pellicle formed, the medium becomes somewhat cloudy, and an abundant, viscid sediment occurs.

Transplants made directly from blood cultures on agar slants did not show a growth visible with the naked eye at the end of twenty-four hours. In forty-eight hours very small colonies were visible which were round, raised and translucent. The growth at this time often resembled water of condensation on the agar. As the colonies became older, they assumed a grayish tint. The individual colony never became larger than a pinhead. The growth was very moist and viscid. To obtain a heavy growth it was necessary to incubate from five to seven days. As successive transplants were made, it was found that the organism grew more rapidly on artificial mediums than when first isolated. The growth was not as satisfactory on Loeffler's blood serum as on agar. Litmus milk was slightly acidified. Stab cultures were made in agar, and it was found that the organism grew best at the top, but quite an abundant filiform growth occurred along the line of puncture.

ANIMAL INOCULATION

Two rabbits were inoculated, saline suspensions from agar slants being given intravenously. The first animal received three inoculations at intervals of seven days without showing any symptoms other than an initial rise of temperature following the inoculations, and a gradual loss of weight up to the time it was killed, twenty days after the last inoculation. Previous to killing the animal, a culture was made from its heart's blood, from which the bacillus, with which it was inoculated, was isolated. At no time was this animal seen to have convulsions. The second rabbit was inoculated four times with an interval of three days between the injections. Fourteen days after the last inoculation, a blood culture was made, and the bacillus, with which the animal had been inoculated, was isolated. At no time did this animal have convulsions.

In the belief at this time that rabbits might have a high immunity to this organism, it was decided to resort to cats. A large male cat was inoculated with a saline suspension of the organism three times at intervals of twenty-four hours. Three hours after the first inoculation the cat was observed to have a convulsion apparently similar to those occurring in epileptics. This convulsion was followed by several others within the next few hours. Following the second injection of the organism, the cat had repeated convulsions which did not stop entirely until noon the next day. Following the third inoculation, the animal went into a state resembling status epilepticus and was expected to die. The number of attacks decreased, however, and after thirty-six hours only one or two convulsions a day were observed. Although this animal was remarkably strong and healthy at the beginning of the experiment, eight days after the last inoculation it was too emaciated and weak even to stand alone. At this time a culture was made from the heart's blood, and the bacillus, with which it had been inoculated, was isolated. Three days later convulsions again developed in this animal, during which it died. Since then three other cats have been inoculated intravenously with the bacillus, and they have all died during or following convulsive seizures. From one of these the organism was isolated after death. It was not attempted in the case of the other two animals, owing to the fact that after death they were removed from their cage and buried by a laboratory assistant who was ignorant of the fact that they had been inoculated. The number of organisms each animal received was not estimated. The growth on an agar slant was emulsified in saline solution and injected into one of the veins of the leg or into the external jugular vein, the latter being large and easily reached.

Besides the intravenous inoculations of the organism, three kittens and five adult cats were each fed once a mixture of fresh cream and a bouillon culture of the bacilli. All of the kittens and four of the grown animals began having convulsions in from three to five weeks after they were fed the organism, and died during convulsions. The other adult cat has passed through a convulsive period twice and now appears

quite toxic, but is yet alive. All of these animals began to deteriorate physically after being fed the germs, the emaciation being quite marked the tenth day after the organisms were ingested. After death, cultures were made from the heart's blood of four of these animals, and the bacillus with which they were fed was removed from two of them.

One cat which was neither inoculated nor fed the organism died in convulsions. This animal was kept in the same cage with those cats which were fed the bacillus. I believe this to be an important occurrence, for it shows that the infection may be transmitted by association, very probably in this instance through fecal contamination.

SUMMARY

Although I began this work profoundly biased in my opinion, as I believed that epilepsy was not bacterial in origin, I am forced to the conclusion that the bacillus which I have isolated, which is identical with the *Bacillus epilepticus* described by Reed, must be an etiologic factor in epilepsy, in view of the following facts:

A bacillus was isolated from 75 per cent. of epileptics examined.

It was present during and following a seizure but not during the intraconvulsive period, except in the case of one patient who was debilitated by ill health.

It was not found in nonepileptics.

It causes typical epileptoid convulsions in cats during which death occurred, both when they are injected intravenously and when they are fed cultures of the organism.

The organism may be recovered from the animal during the convulsions and after death.

CONSTIPATION AND INTESTINAL INFECTION IN EPILEPTICS

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The reports of Caro and Thom[1] and of Wherry and Oliver[2] make it important that I call attention to the fact that the relationship of constipation to epilepsy was the first clinical constant of fundamental importance which was forced on my attention in certain cases in which the patients came to me for surgical relief from the recognizably underlying intestinal stasis. That epilepsy is better or worse as the associated constipation is better or worse is a matter of every day observation by every practitioner of experience. That this constipation is associated with and dependent on mechanical distortions of the intestines is shown by over 800 Roentgen-ray studies of as many of my cases, something more than 2,000 plates being on file in my laboratory. That certain of these patients have apparently recovered from their epilepsy, some from one to five years since operation, and that others have so improved and are so improving as apparently to be on the road to recovery following surgical corrections of the intestinal condition, would seem further to corroborate this relationship between constipation and epilepsy. The fact that Caro and Thom[1] found constipation present in each of the seventy cases that they report as having investigated is an additional confirmation of the coincidence of the two conditions.

The connecting link or links between constipation and epilepsy, two apparently dissociated but persistently coincident conditions, remained to be demonstrated. After careful consideration of all the phenomena presented in nearly 200 of these cases, I was forced logically to recognize that the intermediate condition was one of intoxication of obviously intestinal origin. I was later convinced that this intoxication was due either to bacterial activity or to chemical changes in the intestinal content, or to both. To investigate the bacteriologic phase of the question, I placed Dr. F. P. Hyatt, assisted later by Dr. L. G. Forrer, in charge of my laboratory. After a search in a long series of cases, Dr. Hyatt reported the frequent presence of an organism in the blood of epileptics that could not be found in the blood of nonepileptics. This organism, injected into the blood of rabbits, caused convulsions like those of epilepsy in the human subject, and was recovered from the blood of the animals affected, thus conforming to the third law of Koch.

After what seemed adequate investigation, and for the purpose of stimulating investigation along the same line by others, I made a preliminary report on the organism which, from its obvious relation to the disease, I called the *Bacillus epilepticus*. Dr. Hyatt and Dr. Forrer have since reported the isolation of the organism in 168 out of 211 cases, many of which have been demonstrated to medical visitors to my clinic. I have gladly sent slides and cultures to every investigator who has asked for them, including Dr. Thom and Dr. Wherry.

I mention these facts because they have an antecedent relationship to the contributions of Caro and Thom, and of Wherry and Oliver. These contributions are, respectively, reports of failure to find the *Bacillus epilepticus* in the blood of epileptics examined by them. As purely negative reports, reports of the finding of nothing, they of course can have no relationship, except by inference, to the positive finding of an organism, which, at least, was the finding of something. The obvious and unmistakable inference is that they, professional investigators in large institutions in which things in the blood are found if there are things in the blood to be found, having failed to find the *B. epilepticus*, it follows either that that organism does not exist; or if it does exist, it is a contamination, or, in any event, it has nothing whatever to do with "idiopathic" epilepsy. This is the issue and the only issue which has been raised by the two publications in question, and it is an issue which must be squarely met, both in the interest of science and in that of humanity.

First: The fact of the existence of the organism seems to be fairly well attested. It has been isolated, described, photographed and reported by Bra,[3] by Hinkelmann[4] and by Hyatt and myself.[5] In personal communications I am advised that Terhune[6] has isolated it in 75 per cent. of the epileptics in the East Louisiana Hospital.[6] W. L. Tiffany has found it at

1. Caro, H., and Thom, D. A.: A Bacteriologic Study of the Blood of Seventy Epileptics, with Special Reference to the Bacillus Epilepticus of Reed, THE JOURNAL A. M. A., Oct. 7, 1916, p. 1088.
2. Wherry, W. B., and Oliver, W. W.: Blood Cultures in Epilepsy, THE JOURNAL A. M. A., Oct. 7, 1916, p. 1087.
3. Bra, M.: Compt. rend. Acad. d. sc., Jan. 6, 1902; Rev. neurol., 1902, p. 447; Bull. Soc. méd. d. prat., 1902, xii, 289; Rev. neurol., 1903, p. 408.
4. Hinkelmann, A. J.: Med. Rev. of Rev., xxii, 664; New York Med. Jour., civ, 531.
5. Reed, Charles A. L.: The Bacillus Epilepticus, THE JOURNAL A. M. A., May 20, 1916, p. 1607.
6. Terhune, W. B.: A Bacillus Isolated from Epileptics, THE JOURNAL A. M. A., this issue, p. 1155.

the East New York Hospital at Binghamton; R. L. McMeans, J. R. Wrather and R. D. Gist have isolated it at Amarillo, Texas; R. W. Noble has done the same at Temple, Texas; B. W. Rhemy has found it at the Fort Wayne (Ind.) laboratory. K. W. Smith of Madison, Wis., writes that his assistant has isolated it in two cases, and so has Robert McTavish of Fort William Henry, Ontario. Both Caro and Thom, and Wherry and Oliver have seen the organism, as have numerous others. It would seem, therefore, that the assumption or inference that the organism does not exist is hardly tenable.

Second: The inference that the organism as seen in epileptics is a contamination would seem to be equally unfortunate. Of course the possibility of contamination is always to be recognized. It was recognized and provided against by Hyatt early in these investigations, as indicated in my report. But contaminations are generally variable, even in the same class of cases, and the same contamination is liable to occur in all sorts of cases. It would seem, however, that this particular "contamination" is constant under definite conditions. As a "contamination" it is strange that this particular one should have been observed only in connection with epileptics. It is likewise strange that the same "contamination" should occur and recur so constantly and under precisely the same circumstances at the hands of so many observers. It is strange, too, that the same "contamination," found only when examining epileptics, should be disseminated in localities so widely separated as France, Canada, New York, Louisiana, Texas, Illinois, Indiana, Wisconsin and even Ohio. In short, it would seem that, as a "contamination," the ways of *Bacillus epilepticus* are strikingly peculiar.

Third: The inference sought to be conveyed by these investigators that *Bacillus epilepticus*, whether actually occurring in the blood or as a contamination, has nothing to do with epilepsy, is based not only on their failure to find the organism in the blood, but also by their failure to induce convulsions by injecting it into rabbits. As they failed to get the organism from the blood, they had to rely on the subcultures which I furnished them. I sent Dr. Thom a single agar slant which, of course, was a subculture. Dr. Wherry made a subculture from a subculture furnished him by Dr. Hyatt. If the injections were made from the subcultures thus furnished, the aggregate amount injected, as demonstrated by both Bra and Hyatt, and later confirmed by Terhune, was not sufficient to overcome the natural immunity of the animals. If larger amounts were used, it had to come from further subcultures with resulting diminution of virulence to a point to make them relatively innocuous. In any event, the experiments made in contravention of the published technic of Bra and Hyatt and Terhune cannot be said to be a test of either their methods or their results, and are, therefore, intrinsically worthless. The effort, furthermore, to fortify this inference by quoting the work of somebody who has failed to find the organism at necropsy must go with the other negative findings. Terhune has found the organism at necropsy. Noble reports having found it in the cecum and the appendix. Hinkelmann and Rhemy report having found it in the feces. In my own work, the organism has been cultivated by Hyatt and Forrer from retroperitoneal glands, from the appendix and from the intestines removed at time of operation and from the contents of the cecum in living subjects. These demonstrations, made frequently as to the glands and almost daily as to the cecum, and made in the presence of frequent and competent visitors to my service, are positive and not negative, and must stand until disproved by equally scientific methods actually applied to this particular organism and under similar circumstances.

Fourth: The classification of this organism, a point raised by Wherry and Oliver, is an entirely subsidiary question. I have called it *Bacillus epilepticus* because of its demonstrated relation to epilepsy, and because Bra, Hyatt, Forrer, Terhune, Hinkelmann and others have isolated it from the blood of epileptics. If it shall be shown that it indeed belongs to the *B. subtilis* group, or to any other group, the fact would only signify that a member of that group, or of some other group, as the case might be, is the active agent in epilepsy, and is therefore in reality the *Bacillus epilepticus*. I shall, however, leave this phase of the question alone for the present, and thus not anticipate the report of Dr. Hyatt, shortly to appear, based on an exhaustive study of the characteristics of the organism. It is of the highest importance, however, that its subsidiary importance, from the clinical standpoint, should be held in mind. As pointed out by Hinkelmann, Rehmy and Noble, it may be found in the alimentary canal of persons who do not have epilepsy, although, so far as I know, there is no reliable report that it has ever been found in the blood of nonepileptics. This would seem to imply, as my really large experience would indicate, that mechanical conditions of forced absorption are necessary to make it effective, and that any study of the organism or of any other organism or of toxin or toxins of intestinal origin as etiologic factors in epilepsy should be made only in connection with the physical condition of the gastro-intestinal tract.

In view of the facts which I have set forth, it is evident that the onus of failure to find the organism must be with those making the failure. Any explanation of such failure must, in both justice and generosity, be left to them. I might, therefore, dismiss the discussion at this point if it were not that certain features of the report of Wherry and Oliver require special consideration. This is all the more important in view of the fact that their report is based on the examination of the blood in five of my cases.

It is, therefore, essential for a proper understanding of the facts by the profession that I give the completed bacteriologic records of my cases which Wherry and Oliver report from the standpoint of their individual observation. These completed records are as follows:

Case 1.—Mr. B., epilepsy with folie circulaire; coloenteroptosis; ileac stasis seventy-eight hours; colonic stasis over eighty hours; acidosis marked, persistent and irreversible. Decompression operation had been done several years before, without influencing the course of the disease. Blood examinations by Dr. Hyatt with reference to *B. epilepticus:* January 6, bouillon —; January 14, bouillon +; January 21, agar slant +; February 2, April 5, April 15, all bouillon, all —; May 1, bouillon +; May 10, agar plate +, bouillon —; May 17, both bouillon and agar plate —; May 23, —.

The observations made by Drs. Wherry and Oliver were made during a recrudescence of the folie circulaire, with convulsive seizures, February 24, March 6 and March 6,— really only two different dates. These observations proved negative just as Dr. Hyatt's proved negative, February 2, April 5 and April 15, which, it will be noted, both preceded and followed the observations by Drs. Wherry and Oliver. It is to be noted, furthermore, that this period of negative

blood findings from February 2 to March 6 followed bactericidal and alkalinizing treatment, the discontinuance of which during the patient's period of confinement in the General Hospital doubtless had something to do with the reappearance of the organism in the blood, May 1.

CASE 2.—This is not one of my cases.

CASE 3.—Miss G. R., typical grand mal; marked coloptosis; colonic stasis of more than fifty hours; ileac stasis, marked. Blood examinations by Dr. Hyatt as to *B. epilepticus*: January 19, no growth; February 2, positive; February 18, no growth; March 29, positive; April 12, no growth, bouillon having been used in all instances. The blood for the last observation was taken by Drs. Wherry and Hyatt about thirty-five days after the patient had been subjected to operation, during which time she had been under bactericidal, alkalinizing and eliminative treatment, which may have had something to do with the finding.

CASE 4.—Mr. L., epilepsy with constipation; marked gastrocoloptosis with both ileac and colonic stasis; marked acidosis. Blood examinations with reference to *B. epilepticus*: January 16, +; February 2, —; March 4, —; March 22, —; April 12, —. It will be noted in this case also that the last two observations, both negative, were made several weeks after operation, when in the ordinary course of our experience, negative findings are about due. (It was with the expectation of a negative finding, rather than any other, that both this case and the preceding one were submitted to Dr. Wherry, April 12.)

CASE 5.—Miss E., epilepsy and obstinate constipation, extreme gastro-enteroptosis, ileac and colonic stasis marked, the latter in excess of seventy hours. This patient was referred to Dr. Wherry jointly with Dr. Hyatt for diagnostic study. Each prepared broth, into which the inoculation was made. Three of the tubes retained by Dr. Hyatt showed no growth, while one of them, prepared by Dr. Wherry, proved positive as to *B. epilepticus*. This case did not come under treatment and, consequently, no further blood studies were made.

CASE 6.—Mr. A., epilepsy, with extreme constipation, extreme enterocoloptosis, with resulting stasis, has had two decompression operations without improvement. Blood studies with reference to *B. epilepticus*: April 21, +; April 25, —; May 16, —; May 23, —; from and including April 21, the patient had been under intracolonic bactericidal treatment (by high enemas twice daily) and forced alkalinization and elimination by the intravenous method. This was to prepare him for operation, April 25. The specimen was taken for Dr. Wherry on that date, immediately before the operation was done. That it and the two subsequent observations by Dr. Hyatt should have proved negative is not in the least surprising, especially in view of prompt and as yet complete discontinuance of the previously frequent and severe attacks.

It will be seen from an analysis of these records that positive findings were not made in every specimen taken. In the files of Dr. Hyatt's reports now before me, I find several cases in which positive findings were not reached until in one instance after the sixth. In easily one half of our cases, the finding was negative at the first examination. As nearly as I can estimate in this record, the ratio of positives to negatives is as 7:13. In leafing through this file and taking the cases as they come alphabetically, I find one series of five and another of eight, in which the first examinations proved negative. It will be seen from this that the negative findings of Wherry and Oliver in single examination of four cases and three examinations of one case are not the least surprising, especially in view of the fact that one of these cases did prove positive in their own medium. The same observation applies with even greater emphasis to the report of Caro and Thom.

And now, a word as to the classic work of Bra. It so happened in Europe, at the beginning of this century, that there were several persons who occupied positions which made it their business to find things in the blood, if there were things in the blood to be found. Some were bacteriologists to great hospitals, some were pathologists to institutions for epileptics. They were charged with research, to solve the great mystery of the ages with respect to epilepsy. It also happened about this time that M. Bra — Marie Bra — untrammeled by the medieval scholasticism that then and yet beclouds the subject, went to Ville-Evrard to study the blood of epileptics. She found an organism — found it again and again — found it seventy odd times in a hundred cases — the same organism which we have found and are yet finding under similar circumstances here in America. She injected it into rabbits, gave them epilepsy, and recovered it from their blood. She wrote reports, model reports, of her work, and with them, photographs of the organism in the blood — just as we are now doing in America. Then it so happened that the men whose prestige depended on finding things, and who had not found this particular thing, suddenly found it impossible to find this particular thing. One after another could find nothing. From Moscow to Lille, from the Rhine to the Tiber, each echoed to the others, "Nothing here." But the undisputed and indisputable fact, the positive fact, the photographed, printed and proved fact, the fact that an organism had been isolated from the blood of epileptics, remained. These facts, taken with other facts, seemed to imply a causal relationship between the organism and epilepsy. No new facts were or have been brought out to give it a new interpretation. It was simply beclouded by a policy of concerted and cumulative negation. This was the process of "discrediting" an achievement which did not add to the prestige of the other fellows. Then, Marie Bra, disgusted with the treatment she had received, snapped her fingers at the "scientific" world — and married. It thus happened that humanity was cheated out of a great truth for fifteen years. Is the policy of concerted cumulative negation again contemplated? In this connection it is important for me to say that my attitude with respect to this question is purely that of a clinician interested in the practical phase of the problem. As such I, like other clinicians, must accept and be guided by the technical findings of pathologists and bacteriologists, but they must be the findings of something, not of nothing.

Simple Procedure for Nasal Bleeding.—Spontaneously recurring epistaxis is usually due to a superficial ulceration of the mucous membrane over a vessel or capillaries on the septum of the anterior nares. These hemorrhages as a rule are easily stopped by home remedies, but sometimes the patient seeks relief and goes to the physician between attacks. At these times it is rather difficult to locate the exact spot from which the bleeding originated. If epinephrin chlorid is applied by a cotton-tipped applicator to the side of the septum from which the hemorrhage occurs, the whole mucous membrane, except in those spots in which the bleeding takes place, becomes blanched. If it is a vessel that has caused the bleeding, it will stand out strongly in contrast to the rest of the mucous membrane. If it has been due to capillaries, a red circular spot about the size of half a ten cent piece stands out prominently. This procedure makes it a simple matter to find the bleeding spot and cauterize it with 90 per cent. trichloracetic acid. The acid obliterates the vessel or capillaries, and in a few days it heals over, removing with very little trouble the source of bleeding.—WILLIAM LAPAT, M.D., Savannah, Ga.

New Instruments and Suggestions

THE ADMINISTRATION OF CERTAIN DELIQUESCENT AND LIQUID DRUGS IN CAPSULES

N. S. Davis, M.D., Chicago

It is so much pleasanter to take medicine in capsules than in other ways that it has been my habit when I can do so to administer it in them. Pharmacists find it impossible to dispense extemporaneously in capsules many deliquescent substances and most liquids. A dozen or more years ago my attention was called to the possibility of dispensing many such substances in a capsule by using a wax mass. In this way potassium iodid and similar drugs can be given, also guaiacol, oil of sandalwood and many other liquids which one wishes to prescribe in doses of from 5 to 10 minims. The iodids can be given in doses of 10 or 12 grains (from 0.5 to 0.8 gm.), and the pill will be readily absorbed, as is shown by finding iodin in the saliva in three minutes or less after such a capsule is swallowed.

The capsules are permanent, keeping for weeks ordinarily and in the hottest, dampest weather, if placed in a corked bottle.

For the making of a pill to be placed in a capsule containing sodium or potassium iodid in doses of 10 or 12 grains (from 0.5 to 0.8 gm.), about 1½ grains (0.1 or 0.15 gm.) of the wax mass is needed. Red mercuric iodid and other drugs can be incorporated in the same mass if they are required.

To make a pill containing guaiacol, oil of sandalwood or similar liquids in doses of 5 minims or thereabouts, the same quantity of mass is needed.

I have often given iodin incorporated with this mass, and have obtained from it as prompt and as good results as when it was given in solution. But I have found it possible to give it, without discomfort to patients, in larger doses. For instance, from 2 to 4 grains (from 0.15 to 0.25 gm.) can be given in this way, though I rarely have given more than 2½ grains at a time. I have made it a practice to dilute the iodin well with the mass in order that the pill may not cause gastric discomfort, and possibly I use more of the mass than is necessary for this purpose. I usually prescribe at first 1 or 2 grains (0.05 or 0.10 gm.) with 5 grains (0.3 gm.) of wax mass. Undoubtedly, the oil in the mass is responsible for carrying the iodin and for diluting it and releasing it so as not to cause gastric discomfort. When administered in this way, iodin appears with its usual promptness in the saliva. Cascara, aloes, codein and many other drugs can be incorporated with it when they are needed.

The wax mass is made of one part beeswax and three parts of castor oil. These ingredients are melted and mixed by heating them gently. When liquefied and thoroughly mixed, the mass is allowed to cool. It makes a somewhat granular pill. I do not know who invented the mass, and I have rarely found a pharmacist who knew of it.

I have never seen the castor oil produce looseness of the bowels, and we would not expect it to, so little of it is administered at a time.

Guaiacol and oil of sandalwood and similar substances can be readily mixed with from one-half to equal parts of beeswax and made by gently heating into a mass. Such a one, however, is needed only when a prescriber is using these substances with frequency.

7 West Madison Street.

Steps in Thought.—Observation, comparison, deduction and trial the success or failure of which inspires and directs further observations which form the starting point of a new and wider cast of his net into the sea of the unknown, these are the successive steps in the discipline of thought which has slowly and inevitably led man from helpless dependency on the caprice of nature to the present day when his words travel with the speed of light and his instruments pierce the depths of interstellar space.—T. Brailsford Robertson.

Therapeutics

THE TREATMENT OF DIABETES

(*Continued from page 1091*)

Exercise.—This forms a valuable adjunct in the treatment of diabetes. It serves to raise the carbohydrate tolerance and to build up active protoplasmic tissue at the expense of fat. In addition, the patients who exercise feel better and take more interest in life. The appetite is increased, but the increase is not greater than the increased assimilative power. Allen advises active exercise for practically all diabetics. Strong patients may begin exercise during the preliminary fasting period; weaker ones, during the period of dieting. Exercise is especially advantageous immediately following a meal containing carbohydrate. Short periods of vigorous exercise are preferable to long continued monotonous walks. The patient should stop just short of uncomfortable fatigue. In children, exercise is of especial benefit, as it aids in the building up of muscular tissue and favorably influences growth.

Acidosis.— In the course of diabetes, large amounts of the "acetone bodies," namely, acetone, aceto-acetic acid and beta-oxybutyric acid, may be produced. These substances, for the most part, are products of the incomplete combustion of fats,[11] and appear when there is a disproportionately great metabolism of fat as compared with carbohydrate. For the complete combustion of fat, it seems essential that a certain amount of carbohydrate be simultaneously burned. Under the older methods of treatment the production of large amounts of the acetone bodies at some stage of the disease was usual, and as a result, a large proportion of all diabetics, and especially younger patients, ultimately developed coma — presumably as a direct result of overproduction of the acetone bodies. By strict adherence to the rules of treatment already formulated, it is usually possible to reduce the production of acetone bodies to a minimum.

Of the acetone[12] substances, acetone itself is an adventitious decomposition product of aceto-acetic acid, and is probably never formed in sufficient quantity to do harm. Aceto-acetic acid and beta-oxybutyric acid, however, are fairly strong acids, and for that reason are capable of doing much harm to the organism by the neutralization and removal of the available bases. Acids of one kind or another are always being produced in the course of metabolism, and the body possesses an efficient mechanism whereby these acids may be neutralized or excreted. A slight excess in acid production, such as a few grams of beta-oxybutyric acid, can be completely compensated for. With a larger production of acids, especially if continued over a considerable time, the compensatory mechanism of the body may become overtaxed, with the result that an actual depletion of the alkali reserve

11. Proteins are also, to a lesser extent, a source of acetone bodies.

12. For the detection of acetone bodies in the urine, two tests are in general use, the nitroprussid reaction (Legal, Arnold, Rothera) and the ferric chlorid reaction (Gerhardt). The nitroprussid test is a very delicate one for either acetone or aceto-acetic acid. The ferric chlorid test is a less delicate one and serves to detect aceto-acetic acid. Since amounts of aceto-acetic acid smaller than are required to give the ferric chlorid reaction are of no especial significance, there is, in general, no reason for using the more delicate nitroprussid test. If one of the acetone substances is present in the urine, all are present, and there is no indication for testing for more than one of them. The ferric chlorid test is carried out by adding to the urine a strong solution of ferric chlorid until no further precipitation of phosphates occurs; a purple color indicates the presence of aceto-acetic acid. Salicylates give a similar reaction, but the color may be obtained after the urine has been boiled for a few minutes, whereas aceto-acetic acid is destroyed by boiling.

of the body fluids and tissues occurs. Such a condition is known as acidosis. In diabetes, the appearance of acetone bodies in the urine signifies that the ideal result of treatment has not been attained, but it does not necessarily mean that acidosis is present. Qualitative tests alone on the urine are not sufficient either to confirm or to exclude acidosis, as a strong test may be obtained when no acidosis is present, and only a faint reaction at the height of the coma of acidosis.

A high excretion of ammonia in a twenty-four hour specimen of urine is an indication of abnormal activity on the part of the defensive mechanism of the body, and is a warning signal. Certain symptoms, as increasing drowsiness and deep breathing of the "air hunger" type (acyanotic hyperpnea), may indicate to the skilled observer the onset of acidosis; but for an accurate quantitative idea of the degree of acidosis, determinations on the alveolar air or blood must be made.

Alveolar Air.— In acidosis, there is a diminished carbon dioxid tension in the alveolar air. The determination of this tension is a simple bedside procedure. Marriott has recently described a rapid clinical method for the purpose, for the details of which the reader is referred to the original paper.[13]

A little more difficult, but at the same time more accurate, are determinations of the bicarbonate content of the plasma by Van Slyke's vacuum pipet,[14] or the total alkali reserve of the plasma by Marriott's[15] colorimetric method. These methods all show the degree of acidosis, and it is important that this be known, especially during the fasting period, since failure to recognize a progressive acidosis may result in serious or even fatal consequences.

According to Stillman,[16] diabetics may react in a number of ways to the preliminary fast, as regards the development of acidosis. Some show no significant acidosis either before, during or after the fasting period. Others, with a severe grade of acidosis, existing before the fast, improve during the first fast or during the subsequent fasts. A third group shows a fairly constant, low grade acidosis not especially influenced one way or the other by the fast, but often relieved by subsequent, frequently repeated fasts, alternating with periods of low diet. A fourth group develops increasing acidosis during the fast which may even become of a sufficient degree to prove fatal.

With proper dietetic regulation, the development of acidosis of a serious grade is unusual. The treatment of acidosis is mainly dietetic and preventive. Patients who show a tendency to acidosis while on a diet otherwise suitable should be frequently fasted. As has been mentioned, however, a few patients develop acidosis of an alarming grade during the fasting period, as shown by the characteristic symptoms and by a progressive fall of the carbon dioxid tension of the alveolar air. The normal tension is in the neighborhood of 40 mm.; a tension as low as 35 mm. may be considered as insignificant; tensions below 35 mm. indicate acidosis, and 20 mm. is to be considered the danger point. When such a degree of acidosis is approached during a fasting period, the indication is to break the fast by allowing a restricted diet, chiefly of green vegetables. In such cases, subsequent fasting frequently causes the acidosis to disappear.

Alkali Therapy.— Dietetic treatment prevents the formation of acetone bodies and is the rational treatment for acidosis. Occasionally, however, the acidosis may become of such a grade that the administration of alkali is required. Alkalies neutralize acids already produced and replenish the depleted alkali reserve of the body, but have no effect in inhibiting the production of acids. Alkali administration is merely a temporary means of checking acidosis, but a valuable procedure when acidosis is of a severe enough grade to threaten life. Alkali therapy should not in any measure replace dietetic regulation and should be used only to tide the patient over a critical period. Alkali is indicated when, as a result of the patient's failure to observe dietetic regulation, the alveolar carbon dioxid tension has fallen to 20 mm. or lower, or if coma is present, or obviously impending, and also when, as a result of fasting, progressive acidosis occurs which is not promptly checked by feeding green vegetables.

Alkali in the form of sodium bicarbonate may be administered by mouth, intravenously or subcutaneously. The amount necessary is determined by the degree of acidosis, the size of the patient, and the therapeutic result obtained as gaged by rise in carbon dioxid tension and symptomatic improvement.

Sodium bicarbonate in solution may be given by mouth. In adults, it is usually futile to give less than 4 gm. at a dose, which may be repeated every four or five hours. Doses larger than 15 gm. are generally not well tolerated. Alkali should be continued until the alveolar carbon dioxid tension has risen above 30 mm.

Many diabetics, especially those approaching coma, are unable to retain alkali when given by mouth, on account of nausea and vomiting. In such cases, and, in fact, in the majority of cases in which alkali is required at all, intravenous injection is the method of choice. A 4 per cent. solution of sodium bicarbonate may be used and as much as 500 c.c. injected slowly at a time. The injection may be repeated as often as indicated by the alveolar air findings or the symptoms.

When, for any reason, intravenous injections are not feasible, alkali may be administered subcutaneously. Sodium bicarbonate, on boiling, is converted into the carbonate, which is so caustic that it cannot be injected subcutaneously with safety. If, however, the carbonate is reconverted into bicarbonate, it is available for subcutaneous injection. The conversion may be accomplished by passing a stream of carbon dioxid from a cylinder through the cold sterile solution until saturated, as shown by a change in color of a small amount of added phenolphthalein from pink to colorless. Solutions stronger than 3 per cent. bicarbonate should not be used for subcutaneous administration. As in other methods of giving alkali, the quantity will depend on the degree of acidosis and the response obtained.

From what has been written it is quite apparent that the treatment of diabetes requires special knowledge and more constant and intelligent care than does any other chronic disease. Drugs, with the exception of the alkalies, are worthless, "organotherapy" is a failure, many of the so-called "diabetic foods" are fraudulent, a *laissez faire* policy is fatal. The disease is combated only by management of the diet, which requires as nice discrimination in its use both as to quantity and quality as does any drug. Cooperation on the part of the patient is another requisite. When proper care and satisfactory cooperation can be obtained, the results are usually satisfactory.

13. Marriott, W. McKim: The Determination of Alveolar Carbon Dioxid Tension by a Simple Method, THE JOURNAL A. M. A., May 20, 1916, p. 1594.
14. Van Slyke: Paper to appear soon in Jour. Biol. Chem.
15. Mariott, W. McKim: A Method for the Determination of the Alkali Reserve of the Blood Plasma, Arch. Int. Med., June, 1916, p. 840.
16. Stillman: Am. Jour. Med. Sc., 1916, cli, 505.

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THE MORBIDITY AND MORTALITY STATISTICS OF SCARLET FEVER

Since the day when Sydenham first differentiated scarlet fever from measles and gave to the disease a distinctive name, the malady has been the subject of much speculation and not a little careful study. Many of the peculiarities of scarlet fever as a highly infectious disease still challenge the physician and the epidemiologist. Among the reportable diseases of childhood, scarlet fever probably offers the best opportunity to investigate the incidence of epidemics and the influence of geographic, hereditary and seasonal factors, as well as the possible changes in therapeutic measures on the character of the underlying disease. Donnally[1] has selected scarlet fever for the study of morbidity and fatality; for starting out with all the reportable diseases, as he remarks, it was found that scarlet fever was the one which admitted of such investigation with the greatest satisfaction, because it is and has been for some time generally well reported and has undergone little change in treatment, and also because it can usually be readily diagnosticated. Diphtheria has had its specific treatment, which has tremendously influenced the figures. Measles, whooping cough and chickenpox are often so mild and so much a matter of course that a good proportion of cases are passed through without a call for a medical attendant, and remain unknown to the authorities. Difficulties of nice diagnosis rule out cerebrospinal meningitis from such a study, and infantile paralysis is too recent a disease in health office figures to make its study worth while.

An intelligently guided selection of data from several million cases of scarlet fever throughout the world where reasonably dependable notification exists ought to afford a basis for fairly valid deductions. Donnally found among approximately 2,000,000 presumably well reported cases that there were 104,500 deaths, which gives a case fatality of 5.25 per cent., while the morbidity rate was 3.9, that is, about four persons in each thousand inhabitants had scarlet fever, of whom one person in twenty died.

A marked difference in the incidence of scarlet fever in different localities unquestionably prevails. In large cities the disease may be abundant in some parts and slight or absent in others; in London this is continuously so. In only four of forty years was the incidence of scarlet fever in New York and Brooklyn the same; at times it differed widely, and yet their mean morbidity rates for the entire forty years were identical. Not only is scarlet fever more abundant in some places than in others, but its fatality in one locality may be much greater than in others. The disease, says Donnally, therefore does possess a *genius loci*.

Periodicity in the appearance of epidemics of scarlet fever cannot be made out from the newest epidemiologic study. Morbidity and mortality rates for the disease seem to be independent of each other. Season itself does not influence morbidity. A decline in morbidity has not generally been made out. Notification is at present probably more thorough than ever before. While insusceptible of proof, it is probable that this factor has served to keep morbidity rates in most places approximately level. Where notification has been of longest duration and most thorough (Norway), a reduction in the incidence of scarlet fever has been observed. The sexes as a whole show equal susceptibility. Under 5 years of age, boys are more susceptible, while between 5 and 15 years of age, girls are more susceptible than boys. About half of the cases occur in children between 3 and 8 years, and 90 per cent. in those under 15 years of age. About two children out of three between 3 and 8 years of age contract scarlet fever if exposed to it in their homes, if they have not previously had it.

Scarlet fever appears to be a milder disease than formerly. The most striking fact about the case fatality of scarlet fever in the past half century has been its consistent, general and marked reduction. This diminution in case fatality has occurred in the absence of specific treatment, and while there have been frequent irregularities in its descent, the general downward course is unmistakable and considerable, even comparable to diphtheria in its fall in some places. This reduction exceeds that of the general reduction in infant mortality.

Although the belief in the milder character of the scarlet fever of the present day is widely shared by those whose experience has given them a range of comparative observation over thirty or forty years, the explanation of the lowered fatality is not easy to find. Donnally suggests that the removal of scarlet fever patients to contagious hospitals has improved the care of many patients and may be a contributing factor to lowered fatality. Over 90 per cent. of the patients in London are treated in contagious hospitals, whereas in 1890 there were but 42.8 per cent. thus treated. As patients in hospitals are usually given diphtheria antitoxin, it is quite probable that this is another important factor, because combined scarlet fever and diph-

1. Donnally, H. H.: Scarlet Fever, Morbidity and Fatality, Am. Jour. Dis. Child., September, 1916, p. 205.

theria have had a high fatality. It is conceivable, but incapable of proof, that there is an immunity which may have been increasing in the 300 years more or less since the disease was first recognized.

Donnally's studies further substantiate the belief that scarlet fever is more peculiarly a disease of childhood than is measles or whooping cough, although most children have the latter and acquire a consequent immunity. Nonimmune adults quite readily fall ill with them when exposed, but not so with scarlet fever, with which few exposed adults become affected.

As additional dicta derived from the newly collected data, it may be stated that scarlet fever has regularly been more prevalent and attended by greater fatality in some places than in others. At all ages males succumb more readily to it than females. Case fatality is lowest in those about 10 to 15 years of age. The younger the child, the less is his chance of recovery. About 90 per cent. of deaths from scarlet fever occur in those under 10 years of age.

THE ERADICATION OF WHOOPING COUGH

Pertussis is certainly not an uncommon disease, nor does it deserve to be ranked as a particularly mild affection. It is impossible to give any dependable statistics regarding the incidence of whooping cough because it has not been a reportable disease until lately. Even in New York City, several years after pertussis became legally reportable there continued to be more deaths from the disease than reported cases. The continued agitation and educational propaganda in the matter have begun to alter the situation so that in contrast with 174 cases reported in Greater New York in 1900, fifteen years later there were nearly 7,000 cases reported from Manhattan and Bronx alone.

The older writers regarded whooping cough as a distinctly fatal disease. In England the mortality has been rather high. In America, where it is regarded less seriously, there has nevertheless at times been a higher mortality from pertussis than from scarlet fever. Last year there was a case mortality of 5.6 per cent., that is, 385 deaths out of 6,868 reported cases in New York City. It has been stated that the actual case mortality, when one takes into consideration the unreported and atypical cases and those among adults, is probably from 0.5 to 1 per cent.

Adequate sanitary recommendations for the control and amelioration of a menacing contagious disease presuppose some epidemiologic information. To secure this has been the object of a study begun in 1913 in the Bureau of Laboratories of the New York City Department of Health, a few results of which are already available.[1] The mere history of the death rate from pertussis, independent of any notable progress in prophylaxis or treatment, points a moral as to what might be done if real scientific effort were applied to the problem of whooping cough, and all demands of modern hygiene were effectively enforced in the case of this underrated disease. In the last generation the death rate from whooping cough in the former city of New York (Manhattan and Bronx) has steadily decreased from 25.5 per hundred thousand population to about 7. It is interesting to note that it went up as high as 58.82 and that it was frequently four to five times its present rate. The lowest rate was 4.71 in 1908. Besides the general tendency toward a lower death rate, no rhythm of any kind can be discerned; the number of deaths seems to be independent of any meteorologic or other uncontrollable agencies. The steady lowering of the death rate is probably due to the general increase in knowledge and observation of public and personal hygiene.

One cannot refrain, says Luttinger, who compiled the facts here reported, from comparing this lowering of the pertussis death rate with that of diphtheria. Although no specific therapy had been used in whooping cough until recently, it compares favorably with the diphtheria curve influenced by antitoxin. How much greater might have been the beneficent outcome of an added earlier interest and an aggressive campaign for the management of whooping cough!

The new epidemiologic studies in New York City confirm the belief that pertussis still is a very prevalent disease. Even today probably not more than a tenth of all cases in the metropolis are reported to the department of health. The facts ascertained are as follows:[1] About 80 per cent. of all cases and 97 per cent. of all deaths are in children under 5 years of age. Fifty per cent. of the cases are in those under 2 years of age, and over 50 per cent. of all deaths are in children under 1 year of age. The incidence of pertussis among girls, as well as the number of deaths, is constantly higher than among boys, the proportion of both morbidity and mortality being about 44 per cent. for boys and 56 per cent. for girls. In contradistinction to other respiratory diseases, whooping cough seems to be most prevalent in the spring and summer months, and the mortality curve reaches its highest point in August, showing a similarity to the diarrheal diseases, although most deaths are due to pertussis-pneumonia. Poor surroundings, congestion and lack of fresh air and proper care because of the guardian's precarious economic status seem to have a determining effect on both the morbidity and mortality of pertussis.

No one can doubt that whooping cough is transmitted by direct contact. Luttinger states that in nearly 60 per cent. of cases the source of infection is given as coming from a neighbor. He believes that adult pertussis carriers probably have been disseminating the disease and have remained unrecognized,

1. Luttinger, Paul: The Epidemiology of Pertussis, Am. Jour. Dis. Child., September, 1916, p. 290.

owing to the atypical form in which it manifests itself. Here again, as so often in recent years, the unsuspected carrier has seriously complicated the problems of preventive medicine.

In view of the current divergence of opinion, which represents in reality a lack of dependable observations, on the efficiency of the vaccine treatment, the report from the New York health experts deserves serious consideration. We are told that pertussis vaccines, as prepared by the bureau of laboratories, when given early, have continued to give good curative and prophylactic results at the whooping cough clinic and in the hands of a large number of private practitioners and health officers. The very small number of deaths under vaccine treatment and the vast crowds who apply for treatment at the clinic indicate a favorable and possibly tangible influence of the specific treatment on the further epidemiology of the disease.[1]

In addition to the obvious measures which our present knowledge suggests to reduce the morbidity and mortality of whooping cough, especially in very young children, it is suggested that quarantine should extend during the first two weeks of the disease. Luttinger advises the establishment of more whooping cough clinics and the organization of boat camps, where possible, during the summer time for the rational treatment of pertussis. He also advocates the use of a suitably constructed pertussis hospital, in which the care of patients with severe attacks of whooping cough could be more efficiently undertaken and which would afford an opportunity for further scientific research on laboratory as well as clinical lines. If to these measures are added the education of the public and the awakening of the medical profession to its full duty in the matter, there is every prospect of a successful inroad on the ravages of a widespread contagion.

REMOTE EFFECTS OF NEPHRITIS

A variety of evidence, often of an ill defined and somewhat vague character, has gradually been accumulating to show that defects of the renal function such as are seen in nephritis exert something more than a purely local effect in the organism. Structural defects of the kidneys, as they are found in pathologic conditions of these organs or are induced by experimental methods, are often accompanied by consequences which concern the performance of tissues remote from the site of obvious disease.

An instance of what is here referred to is afforded by a recent investigation of the regulation of the blood volume after saline injections. In this research, conducted by Bogert, Underhill, and Mendel[2] at Yale University, the investigators have made use of the characteristic return of the blood volume to its normal, after dilution in various ways, as the index of a representative response of the organism. It is pointed out that the volume of the blood is one of the important constants of the body, the maintenance of which constitutes a condition of health. With widely varying fluid intake, there must frequently be a tendency toward disturbance of this equilibrium and toward an alteration in the volume of the blood. The mechanism by means of which a constant blood volume is maintained is, therefore, of very general physiologic interest.

After a considerable dilution of the blood, for example by saline injection, the normal volume is ordinarily resumed with surprising promptness. Following the introduction of a quantity of diluent equal to the calculated blood volume, the excess of fluid disappears from the circulation so rapidly that, in experimental animals, the original blood volume is usually restored within half an hour and often sooner. One might naturally be inclined to assume that this prompt regulatory removal of fluid is due entirely to the excretory functions of the kidneys. This is, however, by no means the case; for a comparable regulation proceeds even after ligation or exclusion of the kidneys so that they cannot take any part in the process. Inasmuch as, even in the absence of renal function, a dilution of the blood is still efficiently counteracted, it must be assumed that the tissues play some part in the process. Indeed, it seems clear now that the tissues act up to a certain limit as a reservoir for the excess of fluid, which later leaves the body gradually; and that the activity of the kidney plays only a small rôle in the immediate regulation of blood volume after intravenous injection of salt solutions.

In conditions of nephritis, on the other hand, an inability of the organism to restore the blood volume with equal ease to the normal after saline injections usually manifests itself. At any rate, incomplete or imperfect regulation in this respect has now been demonstrated in the case of individuals suffering from the nephritis induced by uranium salts,[3] by chromates[4] and by tartrates.[2] This failure of fluid to leave the blood and pass into the tissues as rapidly in the nephritic as in the normal individual can scarcely be ascribed solely to the deficient excretory capacity of the kidneys; for it has already been pointed out that these organs are not immediately essential. The Yale investigators believe that an alteration of the permeability of the blood vessel walls offers the only adequate explanation of the changed conditions prevailing in the nephritic subjects. It is concluded, therefore, that the condition of nephritis effects an alteration of the permeability of the walls of the capillaries of the

2. Bogert, L. Jean; Underhill, F. P., and Mendel, L. B.: The Regulation of the Blood Volume after Injections of Saline Solutions: Studies of the Permeability of Cellular Membranes, I, Am. Jour. Physiol., 1916, xli, 189; The Action of Saline-Colloidal Solutions upon the Regulation of Blood Volume, II, ibid., p. 219; The Influence of Alkaline-Saline Solutions upon the Regulation of Blood Volume, III, ibid., p. 229.

3. Boycott, A. E.: Jour. Path. and Bacteriol., 1913, xviii, 11; ibid., 1914, xviii, 498.

4. Chisholm: Jour. Path. and Bacteriol., 1914, xviii, 552.

general circulation in such a way as to hinder the passage of fluid from the blood to the tissues. In this way nephritic conditions exert an influence quite remote from the damaged kidneys themselves.

RELATIVE VALUES IN PUBLIC HEALTH WORK

There is nothing more discouraging to a sincere worker than the realization that, because of meager information, or misinformation, his honest efforts may be misdirected. Certainly the authorities attempting to control the recent poliomyelitis epidemic have been conscious of this. To some degree, indeed, all workers for health preservation find a constant source of discouragement in the lack of accurate data on relative values in public health work. In view of the fact that from a fourth to a third of the deaths which occur in continental United States each year are preventable, no public health official can fail to realize that mistaken judgment on his part in the expenditure of the insufficient funds entrusted to him may mean lives needlessly lost. He has to face the problem of inadequate funds and possible political pressure for the misuse of those funds. Still more grave is the danger that, no matter how honest his own intentions, through lack of accurate information, he may still misuse his resources.

Public health protection is a new activity, there are comparatively few up-to-date reference books, and no one man can hope from his own experience to be able to grasp the whole field. In fact, the average health officer often lacks the specific training and length of tenure in his office which would justify him in depending on his own judgment. Such men particularly, and, indeed, all persons who are interested in original contributions to the scientific data on which all useful preventive medicine must be based, will therefore welcome the study of the "Relative Values in Public Health Work"[1] by Franz Schneider, Jr. Schneider, as the sanitarian of the Department of Surveys and Exhibits of the Russell Sage Foundation in New York City, has undertaken this analysis of relative values at a time when such a study is greatly needed. Schneider disclaims any high degree of accuracy for the conclusions which he offers. In the first place, the figures are based only on reports from cities in the registration area. These, unfortunately, include only about 35 per cent. of the total population, and are entirely inadequate as to sickness statistics; but with proper allowance also for the fluctuation of values caused by local conditions, the figures offered are significant both for the originality and suggestiveness of method by which they were worked out, and as offering a sound foundation for a scientifically planned health program. The thesis is that with limited funds a proper choice of activities is of chief importance. The four prime factors by which may be determined the relative value of activities directed against disease are the amount of damage the disease causes, its preventability, the cost of its prevention, and its tendency to become epidemic. Judged by all these criteria, and only in reference to their relative value as causes of death, the following preventable diseases are rated thus:

RATING OF PREVENTABLE DISEASES

Tuberculosis	16.9
Infants' diseases (including diarrhea, enteritis and bronchopneumonia)	33.9
Contagious diseases of children	30.5
Venereal diseases	9
Typhoid fever	6.1
Other infectious diseases	3.4
Nutritional diseases	.2
Total	100

There are certain activities indispensable to a health department, although they may only indirectly affect the death rate from these diseases. Such activities are health education, the physical examination of schoolchildren, the recording of vital statistics, and the maintenance of dispensaries, clinics and laboratory facilities. The foregoing figures, corrected by making an allowance for these activities and for other factors omitted in the first rating, are altered so as to indicate, as in the following table, the final values of health department activities:

FINAL VALUES OF HEALTH DEPARTMENT ACTIVITIES

Control of tuberculosis	13.1
Control of venereal diseases	6.6
Control of all other communicable diseases	15.2
Infant hygiene	20.3
Privy and well sanitation	3.5
Milk control	4.7
Fly and mosquito suppression	2.4
Food sanitation	1
Inspection of schoolchildren	7
Vital statistics	5
Education	5
Dispensary and clinics	5
Laboratory	5
Total	100

Figures of this kind stimulate the reader to instant questions; but it is because of the careful explanations and painstaking justification of the values given that the report is well worth careful study.

THE ALCOHOL-URIC ACID QUESTION

The answer to the question as to what constitutes a food is becoming more complicated with the development and expansion of our knowledge of metabolism and nutrition. A few years ago the method to be pursued in finding the solution to such a query seemed clear. It was merely necessary to ascertain whether the substance in question could yield energy, not merely in a laboratory apparatus but also in the living organism. The reservation here indicated was necessary for the reason that many substances, which will burn up outside of the body to furnish heat and work, do not digest when ingested by the organism itself, and hence cannot enter the tissues proper to participate in metabolism; or they may be positively toxic, despite

1. Schneider, Franz, Jr.: Relative Values in Public Health Work, read before the Massachusetts Association of Boards of Health, Providence, R. I., July, 1916; Am. Jour. Pub. Health, September, 1916.

their combustibility. Cellulose readily yields heat in the bomb calorimeter; but it passes through the alimentary tract of man unchanged. Its energy is not available, as the student of metabolism expresses it. Strychnin is another organic compound which can easily be burned in a crucible; but it is too toxic for its energy-yielding capacity to be considered.

Nowadays the food question is further complicated by the recognition of the unlike value of different proteins in nutrition,[1] and by the accepted need of food hormones or vitamins which play a rôle independent of any energy which they can yield. Popular enthusiasm for these more subtle and little understood factors in nutrition is now in the ascendant to a degree that may make it necessary soon to sound a reactionary warning. It is detrimental, if not dangerous, to permit the momentary interest in a new discovery to overshadow the importance of older well recognized facts. Energy is an indispensable feature of the body's needs, even if the repetition of the caloric aspects of nutrition tends to seem trite. Dietary preparedness can never be adequate with neglect of the energy problem.

The ever recurring debate on the use of alcohol invariably meets the question, sooner or later, as to whether or not alcohol in any dose can be a food. There can be no issue in the matter so long as one refers to doses of alcohol that are obviously toxic. When the detrimental effects of alcohol overshadow every possibility of latent nutrient virtue, discussion becomes unnecessary. The uncertainty of interpretation arises in connection with so-called moderate doses or among the moderate users of alcoholic beverages. If "beer is merely liquid bread," as the advertisements would sometimes have us believe, its nutritive value must be scientifically established before the statement can be accepted.

The chief mainstay of the defenders of alcohol as a possible food has been the demonstration that small, though not insignificant amounts of alcohol may replace carbohydrate or fat, with an equivalent protein-sparing action.[2] It has been stated in reply, however, that in many cases this effect did not appear until some time after the substitution of alcohol for one of the other nutrients in the diet. Despite the characteristic protein-sparing action of moderate doses of alcohol, it has been found by a number of investigators, more recently by Mendel and Hilditch,[3] that the addition of alcohol to the diet results in an increased excretion of uric acid. If this is to be regarded merely as a normal response to a nutrient stimulus, little exception can be taken to such a reaction; but if it represents a pharmacodynamic effect, one might seriously question the propriety of speaking of alcohol as a typical food in any sense, even if it burns up easily in the body.

The significance of "moderate" doses of alcohol has again come into prominence through the new investigations at the Carnegie Nutrition Laboratory in Boston indicating detrimental psychologic effects from rather small quantities.[4] It is a merit of modern studies in this field that they have been undertaken in a purely objective spirit and without the latent prejudice that almost inevitably attends the promotion of a propaganda, even for good. In this spirit of scientific impartiality, attention is directed to a recent investigation by Hammett[5] in the Medical Department at the University of Southern California. He has determined the effect, on the nitrogen partition in the urine, of substituting isodynamic quantities of alcohol for sucrose during an otherwise fixed diet in man. The alcohol was given in the form of rum, 40 c.c. ($1\frac{1}{3}$ ounces) at each of the three daily meals in place of 30 gm. (1 ounce) of sucrose, and yielding about 370 calories a day. The substitution produced no significant changes whatever in urinary nitrogen partition; in particular, the output of uric acid remained unaltered. The subjects were accustomed to the moderate use of alcoholic beverages.

Increased ingestion of foods — particularly of proteins — may augment temporarily the elimination of endogenous uric acid to a small extent. Hammett remarks that his results do not necessarily indicate that all or even the greater part of the increase in uric acid excretion recorded by Mendel and others, when they added alcohol to the diet, was due to increased caloric intake. He points out, in the first place, that the amount of alcohol ingested by Mendel's subjects was nearly 40 per cent. more than that consumed in the experiments detailed above. This would lead to a more pronounced pharmacodynamic action. In the second place, the subjects used by Mendel were not accustomed to the use of alcohol as a beverage, and hence might be expected to react to a greater extent than would Hammett's subjects, from whose continuous though mild use of alcohol the development of a tolerance might be assumed.

Hammett's deduction from his investigation is conservative. Comparing his results with the widely quoted statement of Mendel and Hilditch[3] that "even in the 'moderate' doses used alcohol increases the output of uric acid" in man, he says that it is indicated that several factors contribute to the effect of alcohol on uric acid excretion; and that in the light of our present knowledge we can make no statement as to the relative importance of any of these factors, much less explain their action.

1. For a review of this subject see Mendel, L. B.: Nutrition and Growth, The Journal A. M. A., May 8, 1915, p. 1539. Underhill, F. P.: Physiology of the Amino-Acids, New Haven, 1916.

2. Physiological Aspects of the Liquor Problem, Boston, 1903, ii, 169. Rosemann, E.: Oppenheimer's Handbuch der Biochemie, 1909-1911, iv, Part 1, 413.

3. Mendel, L. B., and Hilditch, W. W.: Am. Jour. Physiol., 1910-1911, xxvii, 1.

4. New Evidence Against Alcohol, editorial, The Journal A. M. A., March 4, 1916, p. 742.

5. Hammett, F. S.: The Effect on Nitrogen Partition of Substituting Alcohol for Sucrose in an Otherwise Fixed Diet, Jour. Biol. Chem., 1916, xxv, 601.

Current Comment

EXPOSURE TO COLD AS A CAUSAL FACTOR IN DISEASES OF THE RESPIRATORY TRACT

While it is generally admitted that most diseases of the respiratory tract are of bacterial origin, it has not been wholly determined whether or not the sudden exposure of the whole or part of the body to marked changes of temperature predisposes to various infections. Chodounsky[1] in 1907 experimented with the effects of various bacilli on the lower animals and also made repeated studies on his own person. He was 57 years of age, subject to catarrh, to frequent attacks of bronchitis and to lumbago. He exposed himself naked to cold air and drafts at temperatures from 3 to 12 C. for periods of time varying from twenty minutes to one hour, immediately after cold or hot baths. Exposure to cold he concluded was not a causal factor in diseases of the respiratory tract. Yet considerable evidence has accumulated in support of the opposite view. Lipari,[2] Lode,[3] Pasteur,[4] and Kline and Winternitz,[5] experimenting variously with infected animals, are all in accordance with the general conclusion that exposure to sudden changes of temperature lessens the resistance of animals to infection. The New York State Commission on ventilation[6] reported the results of a clinical study of nearly 150 men subjected to sudden changes of temperature. It was concluded that such changes may be a factor in the causation of acute colds. Lately, J. A. Miller and W. C. Noble,[7] working under the auspices of the same commission, have added some important data still further supporting this view. They infected a number of rabbits with *Bacillus bovisepticus*. This organism produces a general septicemia at times, but in some cases it is localized in the upper respiratory passages, in which it produces a condition commonly known as snuffles and may terminate in pneumonia with or without septicemia. Thirty-seven rabbits were kept in an incubator at varyingly high temperatures for different periods of time. They were then infected by spraying the nasal mucous membrane with saline suspension of *Bacillus bovisepticus*, after which they were exposed to cold for periods of from one-half to three hours. The animals were also wet with water to facilitate chilling. Both the mortality and morbidity were greater in the exposed animals than in a like number of controls maintained under normal conditions. The same general results were obtained when the animals were exposed to several changes of temperature, and the effect was even more marked when they were subjected to heat after exposure to cold. Although positive conclusions cannot be drawn from animal experimentation along this line, taken in conjunction with the results of several of the clinical studies, there is sufficient evidence from which to draw certain practical, working conclusions. The importance of the outdoor treatment of pulmonary tuberculosis and many other conditions is well established. It must not be forgotten, however, that the resistance of many of these patients to various infections is low. They should not be subjected suddenly to violent extremes of temperature, and proper precautions should always be taken against chilling of the body surfaces. It seems evident that the exposure of a portion of the body to cold is more likely to be followed by acute respiratory infections than when the entire body surface is subjected to the same low temperature, and the popular idea that drafts predispose to respiratory infection in some individuals is therefore not without foundation.

1. Chodounsky, K.: Erkältung und Erkältungskrankheiten, Vienna, 1907.
2. Lipari, G.: Morgagni, 1888, xxx, 523, 575, 651.
3. Lode, A.: Arch. Hyg., 1897, xxviii, 344.
4. Vallery-Radot, R.: The Life of Pasteur, New York, 1902, ii, 61.
5. Kline, B. S., and Winternitz, M. C.: Jour. Exper. Med., 1915, xxi, 304.
6. "Cold in the Head," editorial, THE JOURNAL A. M. A., April 15, 1916, p. 1201.
7. Miller, James A., and Noble, Willis C.: Effects of Eposure to Cold on Experimental Infection of the Respiratory Tract, Jour. Exper. Med., Sept. 1, 1916, p. 225.

THE SUPRARENALS AND POLYCYTHEMIA

Last year Lamson[1] of the Pharmacologic Laboratory at the Johns Hopkins University called attention to the fact that, contrary to the customary assumption, the number of red corpuscles per unit volume of blood is not constant, but is subject to rapid and by no means negligible changes; indeed, it is continually changing under physiologic conditions. It appears that the "red count" is under nervous control. The number of erythrocytes is reported to increase after emotional excitement, such as fear or rage. Several important facts have been brought out in relation to acute experimental polycythemia. This condition can be provoked very promptly by injections of epinephrin. By a series of ingenious experiments Lamson[2] has found it more than probable that the liver is the organ responsible for the changes in the number of red cells induced in this way. Polycythemia will not take place unless the liver is connected with the circulation. The process by which the liver increases the number of erythrocytes is thought to be a loss of plasma from the liver capillaries, together with a constriction of these vessels driving the erythrocytes on into the blood stream. It has been experimentally shown that the liver capillaries constrict with epinephrin, causing a sudden diminution in size of the liver. What is the normal mechanism in the body for regulating the sudden changes in the red corpuscle content of the blood? It obviously is under nervous control and responds to nervous, chemical and emotional stimuli. A direct nervous influence, however, can scarcely be at work; for stimulation of the nerves to the liver causes no increase in the number of erythrocytes, according to the new observations of Lamson.[3] Furthermore, in animals in which epinephrin causes no polycythemia, nervous stimuli also cause no increase in the red blood count. It seems probable, therefore, to Lamson that the polycythemia following the stimulation of certain

1. Lamson, P. D.: The Rôle of the Liver in Acute Polycythaemia: The Mechanism Controlling the Red Corpuscle Content of the Blood, Proc. Nat. Acad. Sc., 1915, i, 521.
2. Lamson, P. D.: Jour. Pharmacol. and Exper. Therap., 1915, vii, 169.
3. Cf. Lamson, P. D.: The Processes Taking Place in the Body by Which the Number of Erythrocytes per Unit Volume of Blood is Increased in Acute Experimental Polycythaemia, Proc. Nat. Acad., 1916, ii, 365.

nerves is not due to a direct nervous influence, but to a reflex stimulation of the suprarenals, and a secondary action of epinephrin on the liver. Thus the burden of one more regulatory function in the ever responsive organism is laid at the feet of the suprarenal gland mechanism. It helps to explain the observation that removal of the suprarenals excludes the manifestation of polycythemia in rage, fear or asphyxia; although even suprarenalectomized subjects respond to the injection of epinephrin by the characteristic increase in the number of red cells. Furthermore, removal of the suprarenals is soon followed by a complete loss of functional control of the number of erythrocytes in a unit volume of blood.

THE BLOOD PRESSURE IN PNEUMONIA

The development of accurate methods of investigation in clinical medicine and the expression of the results in terms of definite quantitative measurements have served to dispel many of the long current assumptions that had little more than a traditional probability to support them. In the descriptions of pneumonia, for example, one reads of sudden collapse of the circulation, with weakness and irregularity of the heart and the pulse, the low blood pressure, subnormal temperature, and other attendant symptoms. These have been ascribed to "toxic paralysis of the vasomotor centers, toxic degeneration of the myocardium, and excessive pressure in the pulmonary circulation." The long held belief that the toxins of pneumonia specifically injure the vasomotor apparatus has been clearly disproved by Porter and Newburgh.[1] Even in fatal cases, in animals about to die with almost wholly consolidated lungs, the vasomotor reflex commonly remains normal. Further studies by these investigators[2] at the Harvard Medical School indicate that the blood pressure in experimental pneumonia is frequently somewhat less than normal, but, in their experience, has never been so low as to endanger life. This corresponds with the observations by Newburgh and Minot[3] of blood pressure in pneumonia in the wards of the Massachusetts General Hospital and the Johns Hopkins Hospital. It was found that the average of the readings taken morning and afternoon during the course of the disease was from 110 to 120 mm. of mercury. The normal for human beings of corresponding age is 120 to 130 mm. The lowest observed pressure was 90 mm., with three cases at 100 mm. Taken in their entirety the now known facts, clinical and experimental, indicate that the blood pressure in pneumonia does not serve the same prognostic value that was formerly attributed to it when the dictum prevailed that persons likely to die of this disease would have a low or falling pressure days before the fatal issue.

1. Porter, W. T., and Newburgh, L. H., and Ll.: Boston Med. and Surg. Jour., 1914, clxx, 125; The State of the Vasomotor Apparatus in Pneumonia, Am. Jour. Physiol., 1914, xxxv, 1.
2. Newburgh, L. H., and Porter, W. T.: The Blood Pressure in Experimental Pneumonia, Am. Jour. Physiol., 1916, xli, 384.
3. Newburgh, L. H., and Minot, G. R.: Arch. Int. Med., 1914, xiv, 48.

A Smiling Countenance.—It is the mark of a skilled practitioner to sit a while by the bedside, with a blithe countenance.—Celsus.

Medical News

(Physicians will confer a favor by sending for this department items of news of more or less general interest; such as relate to society activities, new hospitals, education, public health, etc.)

COLORADO

Personal.—Dr. Charles D. Rilance, Denver, sailed on the *Noordam*, September 23, to join the Convalescent Hospital at Bath, England.

Consolidation of Medical Departments.—A consolidation of the surgeons in the police department and the health department of Denver has been effected so that all the medical officers will work under one jurisdiction, responding both to ambulance calls and to poor and public service cases.

Sanitary Expert Visits Denver.—Surgeon Carroll Fox, U. S. P. H. S., is in Denver on invitation of the state survey commission and the state board of health to investigate the sanitation in the cities and rural districts of Colorado, the water supply and milk supply, the health laws of the state, and the facilities for fighting epidemics at home.

CONNECTICUT

Silliman Lectures.—The Silliman lectures at Yale University for 1916 were delivered by Dr. J. S. Haldane at the Lampson Museum, October 9, 10, 12 and 13, at 5 p. m., on "Organism and Environment as Illustrated by the Physiology of Breathing."

Yale Health Board Organized.—Yale University announces the organization of a university board of health, with Dr. James C. Greenway, New Haven, as university health officer. The board will be made up of the several deans; the professor of public health in the school of medicine; the professor of hygiene in the scientific school; the treasurer of the university; the director of the gymnasium, and the chairman of the athletic committee.

Pathologist Resigns.—Dr. Jessie W. Fisher, pathologist at the Connecticut Hospital, Middletown, for several years, has resigned to accept the position as pathologist of the Middlesex Hospital, Middletown. She will also be in charge of the new laboratory at that institution and will be pathologist of the Cromwell Hall Sanatorium. The vacancy on the Connecticut Hospital staff has been filled by the appointment of Dr. Arthur S. Gibson, Boston.

GEORGIA

Medical Defense Department Organized.—The Medical Defense Department of the Medical Association of Georgia met in Augusta, September 9, for organization and elected Dr. Mallie A. Clark, Macon, chairman; Dr. William C. Lyle, Augusta, secretary, and Col. M. L. Felts, Warrenton, general counsel.

Building Given to Emory University.—Bishop Candler, chancellor of Emory University, announces the receipt of a contribution of $50,000 from J. J. Gray, Jr., Rockdale, Tenn., for the erection of an outpatient building in conneciton with the medical department of Emory University, the building to be known as the J. J. Gray Clinic.

Personal.—Mr. Barnett Cohen, assistant in the laboratory of the Savannah Health Department, has resigned to accept a position in the department of public health of Yale University, New Haven, Conn.——Dr. Emory R. Park, Atlanta, has resigned from the state board of health.——Dr. Robert E. McClure, Macon, has been elected superintendent of the State Tuberculosis Sanatorium, Alto, succeeding Dr. William V. Parramore, Alto, resigned.——Dr. Walpole C. Brewer has been appointed a member of the board of health of Atlanta.——Dr. William C. Lyle has resigned the management of the University Hospital, Augusta.——Dr. Lamartine G. Hardman, Carrollton, is a candidate for governor of Georgia.——Dr. Henry M. Michel, Augusta, will remain in France until the end of the war.——Dr. William R. Houston, Augusta, who has been in charge of a large hospital at Lyons, France, has returned to this country.——Dr. Robert C. Goolsby, Forsyth, announces his candidacy for representative of the General Assembly.——Dr. John A. White, Augusta, has been elected commissioner of health for Dougherty County.

ILLINOIS

To Study Poliomyelitis.—In anticipation of an epidemic of poliomyelitis next summer, the Illinois State Board of Health has arranged for a number of conferences on the subject at different points in the state during the winter months.

Charities and Correction.—The twenty-first annual state conference of Charities and Correction will be held at Alton, October 20 to 22. The chief subjects for discussion are, children, rural social service, mental and physical efficiency, the family and its needs, probation and prevention of crime, and labor and compensation.

Chicago

Life **Extension Institute.**—The Life Extension Institute of New York City, it is reported, has arranged to open a branch office in Chicago.

Memorial Meeting for Dr. John B. Murphy.—October 11 was observed by the Chicago Medical Society as Dr. John B. Murphy memorial night. The following were announced as speakers: Drs. George W. Crile, Cleveland; C. A. L. Reed, Cincinnati; Frank Billings, L. L. McArthur, E. Wyllys Andrews, D. A. K. Steele, A. D. Bevan, W. E. Quine, A. J. Ochsner, Jacob Frank and W. A. Evans, Chicago.

Personal.—Dr. Dwight C. Orcutt has been appointed ophthalmic surgeon at the Illinois Charitable Eye and Ear Infirmary, succeeding Dr. Oscar Dodd, resigned.——Dr. Albert H. Roler, Evanston, has been appointed, by the secretary of state, assistant at the American Embassy in Berlin, his duties being to inquire into and report on the condition of British prisoners in Germany and German prisoners in Russia. Dr. Roler sailed for Berlin, October 12, via Denmark.——Prof. Roy G. Hoskins, formerly associate professor of physiology of Northwestern University Medical School, has been appointed professor and head of the department of physiology in that school.

IOWA

Clinical Society to Meet.—The Iowa Clinical Medical Society will hold its next meeting at the Iowa City University Medical School, Iowa City, December 2.

Personal.—Dr. Donald Macrae, Jr., Council Bluffs, has been placed in charge of the Brownsville (Texas) Base Hospital.——Dr. Ralston W. Sleeter has been appointed local surgeon at Rockford for the Rock Island System.——Dr. Hugh Mullarky, Manson, has been nominated as the Democratic candidate for state senator.——Dr. William E. Owen, Cedar Rapids, was elected vice president of the Iowa State Cymrodorian Society at its meeting in Iowa City, September 8.——Dr. Merle Bone has resigned as house physician at the Miners Hospital, Albia, and has been succeeded by Dr. Isaac H. Odell, Albia.

KANSAS

Car for Health Exhibit.—Mr. Robert Lincoln, chairman of the board of directors of the Pullman Company, has presented a car to the Kansas Department of Health to be used for the public health, child hygiene and propaganda exhibit of the board.

Personal.—Dr. Newton A. Seehorn, Hutchinson, has been appointed physician at the State Reformatory, succeeding Dr. Frederic A. Forney, Hutchinson, resigned.——Dr. William E. Michener, Ottawa, has succeeded Dr. Charles E. Buckley, Ottawa, resigned, as secretary of the Franklin County Medical Society. The society in accepting the resignation adopted a set of resolutions complimentary of Dr. Buckley and presented him with a gold watch charm.

MARYLAND

Personal.—Dr. Allen K. Krause, former head of the Trudeau Sanatorium at Saranac Lake, N. Y., has arrived at Johns Hopkins Hospital to assume general charge of the Phipps Tuberculosis Dispensary and to direct the work in this department, made possible by the recent gift of Mr. Kenneth Dows, New York. Dr. Krause has not completely severed his connection with Trudeau Sanatorium, but will return there each summer for four months. His connection with the two institutions will link together the work done at both places.

The Infantile Paralysis Situation.—A number of new cases having been reported to the city and the state departments of health, Health Commissioner Blake has deferred the opening of the kindergarten and six lower school grades. These cases are scattered through all parts of the city and the various counties. In a number of instances, the disease has not been recognized promptly and that, in part, accounts for this spread. Children under 16 years of age are no longer required to obtain certificates to leave the city, but the health officials of New York, New Jersey and Pennsylvania have been notified that all children under 16 years must have health certificates before coming to Baltimore and these will be quarantined for fourteen days. Several cases have developed here shortly after children have arrived from other states.——The United States Public Health Service has issued an order withdrawing its forces from Baltimore, but has recommended that no let-up be made in the quarantine regulations.——Dr. James R. Hurley and Dr. C. H. Waring of the U. S. P. H. S. have been recalled to Washington and Dr. Joseph R. Ridlon has been ordered to Tampico, Mexico, to investigate sanitary conditions.

Ordinance for the Pasteurization of Milk Urged.—On account of the minor epidemic of typhoid fever during the last few months, the cause of which has been traced to unpasteurized milk, the health department is making an effort to have the city council pass an ordinance requiring the pasteurization of all milk sold in Baltimore. The Milk Bottlers' Exchange is cooperating with the health department, and has adopted resolutions urging immediate action on the part of the city council. A series of meetings in the interest of the pasteurization of milk is to be held during the autumn and it is said that the proposed ordinance will be generally indorsed and passed with no opposition. It developed that the state agricultural board, recently appointed, has the power to order the pasteurization of all milk sold in Maryland, in the towns and villages as well as in the large cities. The board is already interested in a plan with this end in view and the statement has been made that it would back any ordinance passed by the city council or any regulation Dr. Blake adopted.——The monthly report of the health department, issued recently, showed 189 cases of typhoid fever were reported in September, three more than last year. Twenty died from the disease, compared with twenty-two a year ago.

MASSACHUSETTS

Hospital Soon to be Opened.—The Beth Israel Hospital, located at 45 Townsend Street, Roxbury, Boston, the first Jewish institution of its kind in Boston, will be formally dedicated, October 22. The hospital, although a Jewish institution, will not be restricted to any creed or color so long as the Jewish dietary laws are upheld.

Free Choice of Medical Attendance for Working Men.—A meeting of committees of five of the various district societies was held in Worcester, September 20, to consider and plan a movement looking to the amendment of the Workmen's Compensation Act which will allow injured employees freedom of choice of medical attendance.

Personal.—Dr. Beatrice H. Brickett, Newton Highlands, has been appointed superintendent and resident physician of the Massachusetts Women's Hospital, Parker Hill, Roxbury, Boston, succeeding Dr. Edith M. Brooks, who, after a period of twelve years in charge of the hospital, resigned this summer.——Dr. Thomas H. Kenney has been elected a member of the board of health of Northampton.

Harvard and Poliomyelitis.—Harvard Medical School has established a commission to assist in the early recognition, treatment and study of infantile paralysis. The commission consists of Dr. Robert W. Lovett, chairman; Drs. Milton J. Rosenau and Francis W. Peabody, Boston, and Mr. Roger Pierce as secretary of the commission. The commission will work in close cooperation with the state department of health and the local health authorities.

Poliomyelitis.—Surg. Lumsden D. Fricks, U. S. P. H. S., has reported for duty at Boston with the state board of health, and has gone to Holyoke, where infantile paralysis has obtained a strong hold, to give assistance to the local authorities, and to make a health survey.——On the recommendation of the governor, the legislature has passed the Bates bill, which allows local boards of health to establish quarantine when an epidemic of infantile paralysis is threatened.——Up to September 27, 523 cases of poliomyelitis had been reported to the state health department, or about double the number of cases reported in August.

Ether Day.—The seventieth anniversary of Ether Day will be celebrated at the Massachusetts General Hospital, October 16. The exercises will be held at 4 p. m. in the Moseley Memorial Building, which has been recently completed and was erected as a memorial to William Oxnard Moseley, a

house pupil at the Massachusetts General Hospital in 1878. After introductory remarks and presentation of diplomas by Dr. Henry P. Walcott, Boston, president of the corporation and chairman of the board of trustees, there will be an address by Dr. Herbert Burr Howard, superintendent of the Peter Bent Brigham Hospital, followed by the Ether Day address by Dr. Haven Emerson, commissioner of health of New York.

Faculty Changes in Harvard.—Drs. Abraham Myerson, Farrar Cobb, Frederic Jay Cotton, William Edward Faulkner, Joshua Clapp Hubbard, Daniel Fiske Jones and Fred Bates Lund have been appointed associates in Harvard Medical School for one year; Dr. Horace David Arnold has been appointed director; Dr. Alexander Swanson Begg, dean, and Drs. Edward Hickling Bradford, George Gray Sears, Algernon Coolidge, Charles Locke Scudder, Milton Joseph Rosenau and Francis Weld Peabody, members of the administrative board of the Graduate School of Medicine of Harvard University.——The Harvard corporation has made the following appointments: Dr. Charles W. McClure, alumni assistant in medicine; Dr. Andrew Watson Sellards, associate in tropical medicine; Dr. George B. Magrath, instructor in legal medicine; Dr. Le Roi Goddard Crandon, assistant in surgery; Dr. Francis Gorham Brigham, assistant in medicine; Dr. Frederic Codman Cobb, associate in laryngology; Dr. Charles Locke Scudder, assistant professor of surgery; Dr. Harris Peyton Mosher, instructor in anatomy; Dr. David Cheever, associate in surgery; Dr. Samuel Walker Ellsworth, assistant in roentgenology; Dr. Peter Hunter Thompson, clinical assistant in ophthalmology; Drs. Joseph Maria Thuringer and Paul Eugene Lineback, assistants in histology and embryology, and Dr. William Richard Ohler, Austin teaching fellow in bacteriology.

MINNESOTA

Outing for Crippled Children.—The tenth annual outing for children from the State Hospital for Crippled and Deformed Children, given by Dr. and Mrs. Arthur J. Gillette, St. Paul, at their summer home, Dellwood, White Bear Lake, occurred September 12, when 100 children from the home were taken to the lake by automobiles, entertained with moving pictures and then taken for trips on the lake and for supper in the Gillette residence.

Charities and Correction.—The Minnesota Association of Charities and Correction opened its annual conference in the First Presbyterian Church, Stillwater, September 23, and continued in session until September 26. Dr. Robert M. Phelps, St. Peter, is president of the conference, and among topics for discussion were "Criminology and Its Alliance With Mental Defectives"; "Providing for the Mentally Defective Child," and "Standards in Child Placement."

Personal.—Dr. William H. Hengstler, Osakis, has disposed of the Park Region Hospital, Osakis, to Dr. Emil Haberman, Minneapolis, and expects to locate in Portland, Ore., next spring.——Dr. Horace H. Witherstine has been elected president of the newly organized antituberculosis society of Rochester.——Dr. Adrien J. Kirghis, Sauk Center, has returned after several months' service in the French war hospitals.——Dr. Carl F. Raver, Mankato, has been placed in charge of the Mankato laboratory of the state board of health.

Health Safeguards.—The governor has appointed a commission composed of the following members to investigate and report on the need of additional health safeguards for the citizens of the state: Dr. E. P. Lyon, dean of the University of Minnesota, Medical School, Minneapolis; C. G. Schulz, superintendent of the state department of education; William F. Houk, state labor commissioner; C. J. Swendsen, chairman, state board of control; Senator L. E. Potter, Springfield; Drs. Arthur T. Laird, superintendent of the Nopeming Sanatorium; Louis B. Wilson, Rochester; Warren L. Beebe, president, and Ignatius J. Murphy, St. Paul, executive secretary of the Minnesota Public Health Association. At the meeting for organization, held September 20, in St. Paul, Dr. E. P. Lyon was elected chairman, and Dr. Ignatius J. Murphy, secretary of the commission.

MISSOURI

Personal.—Dr. Herman E. Pearse has been elected president of the staff of the Kansas City General Hospital, succeeding Dr. Jefferson D. Griffith, retired.——Dr. Charles R. Woodson, St. Joseph, entertained nearly 100 members of the Buchanan County Medical Society at dinner at the Woodson Sanitarium, September 16.

St. Louis

Care for Families of Militiamen.—Cooperating with the National Militiamen's Association, the members of the St. Louis Medical Society have given medical and surgical service to about sixty families. In addition St. Mary's Infirmary, St. John's, St. Louis Mullanphy, St. Anthony's, Jewish, Alexian Brothers, Mt. St. Rose, Barnes, St. Luke's, Deaconess and Lutheran hospitals, the Missouri Baptist Sanitarium and St. Ann's Maternity have volunteered to accommodate members of the militiamen's families free of charge.

NEW HAMPSHIRE

Society Meeting.—At the annual meeting of the Dover Medical Society at Rochester, September 8, the following officers were elected: president, Dr. Thomas J. Morrison, Somersworth; vice president, Dr. John H. Bates, East Rochester, and secretary, Dr. Roland J. Bennett, Dover.

NEW YORK

State Plans After-Care of Infantile Paralysis.—Dr. Dinsly R. Williams, Albany, deputy state commissioner of health, has announced a comprehensive plan for the after-care of infantile paralysis patients. He announces that Dr. Robert W. Lovett, Boston, will cooperate with the state health department, and that clinics will be held in various places throughout the state where persons who have had the disease may come for advice and treatment.

Personal.—Dr. Herbert H. Smith, Cape Vincent, has been appointed physician in charge of the Jefferson County Tuberculosis Hospital, Watertown.——On account of the reduction in the number of cases of infantile paralysis, Dr. Frederick J. Garlick, Rochester, has been relieved of duty as expert diagnostician for the state department of health.——Dr. John Van Duyn, Syracuse, has returned after several months' service in France.——Dr. Guy H. Turrell, Smithtown Branch, has been appointed sanitary supervisor in the state department of health.

New York City

Federal Inspection of Infantile Paralysis Ends.—The federal inspection of interstate travel, which was instituted last July in this city, was discontinued, October 4. The number of new cases of infantile paralysis reported on that date was twelve, with eight deaths. That represents a fair average of the number of new cases reported each day during the week.

Gifts to Columbia.—At a recent meeting of the trustees of Columbia University, a number of gifts were announced, among which were an additional contribution of $7,000 toward the proposed new building for the dental school, $5,000 from Clarence H. Mackay to be added to the fund for surgical research, and $1,000 from Willard V. King to be applied to the medical school removal and rebuilding.

Health Library for City.—The Municipal Reference Library, which is in the Municipal Building, will establish a public health division on the fifth floor of the Health Department Building. It will specialize on child hygiene, drugs, food analysis, food inspection, food regulations, food supply, hospitals, health insurance, milk supply, occupational hygiene, school inspection, contagious diseases and vital statistics. This library will be open to the public.

The Cartwright Lectures.—The Cartwright lectures of the Association of the Alumni of the College of Physicians and Surgeons will be delivered at the College of Physicians and Surgeons, 437 West Fifty-Ninth Street, Tuesday and Wednesday afternoons, October 24 and 25, 1916, at 5 o'clock, by Dr. Richard M. Pearce, Jr., professor of research medicine, John Herr Musser Department of Research Medicine, University of Pennsylvania, Philadelphia. His subject will be "The Spleen in Its Relation to Blood Destruction and Regeneration."

Personal.—Dr. Arthur M. Jacobus has been appointed a member of the council of the New York Academy of Medicine to fill the place of Dr. Adoniram Brown Judson, deceased.——Dr. James R. Hayden has resigned his professorship of urology at the College of Physicians and Surgeons of Columbia University.——Dr. James W. Jameson has been appointed instructor in surgery at Columbia University and Dr. Guy Alvin Caldwell and Dr. Donald Gordan have been appointed instructors in clinical surgery.——Dr. Henry L. Shively has been appointed professor of clinical medicine in the department of tuberculosis of Fordham University.

Harvey Society Lectures.—The twelfth course of Harvey Society lectures will begin October 14 and close April 7. The lectures will be given on Saturday evenings in the New York Academy of Medicine. The following lectures are announced:

October 14—Prof. J. S. Haldane, "The New Physiology." November 4—Dr. F. M. Allen, "The Rôle of Fat in Diabetes." November 25—Dr. Paul A. Lewis, "Chemo-Therapy in Tuberculosis." December 16—Prof. Henry H. Donaldson, "Growth Changes in the Mammalian Nervous System." January 13—Prof. E. V. McCollum, "The Supplementary Dietary Relationships Among Our Natural Foodstuffs." February 3—Prof. J. W. Jobling, "The Influence of Non-Specific Substances on Infections." February 24—Prof. John R. Murlin, "The Metabolism of Mother and Offspring Before and After Parturition." March 17—Prof. Francis W. Peabody, "Cardiac Dyspnea." April 7—Prof. W. H. Howell, "The Coagulation of the Blood."

Mental Hygiene Lectures.—Six free lectures on mental hygiene are to be given during October and November at the Y. M. C. A. hall at 5 West One Hundred Twenty-Fifth Street, under the auspices of the city department of education. The course has been arranged in cooperation with the mental hygiene committee of the State Charities' Aid Association. The first lecture was given on October 11 when Mr. Homer Folks spoke on "Why Should So Many Go Insane?" Other lectures will follow: October 18, "The Social Cost of Mental Disease," by George A. Hastings; October 25, "Preventable Mental Diseases and How to Prevent Them," by Dr. Stewart Paton, Princeton, N. J.; November 1, "Social Hygiene as an Aid to Mental Health," by Dr. Ira S. Wile; November 8, "How the Empire State Cares for 34,000 Insane," by Dr. William Mabon; November 15, "The Immigration Problem and Insanity," by Dr. Henry Smith Williams.

Quack Preventives and "Cures" for Infantile Paralysis.—The department of health has succeeded in obtaining jail sentences and substantial fines as penalties in the case of two persons who attempted to exploit "cures" for poliomyelitis in this city. The first of these was a Mr. Frooks who made and sold amulets to be worn around the neck as a protection against infantile paralysis. An analysis made by the department of laboratories showed that the amulet consisted of a cotton bag containing cedar shavings. The court found Frooks guilty and sentenced him to thirty days in jail and a fine of $250. James T. Manchester was also sentenced to thirty days in jail for having manufactured and sold a preparation called "Sol" which was represented as being a cure for infantile paralysis, consumption, rheumatism and other ailments. This preparation, on analysis, was found to consist essentially of capsicin, sassafras and alcohol.

Supreme Court Upholds Health Department.—Considerable newspaper publicity has been given the case of Mrs. Anton Anderson, Jamaica, whose 19-months-old son was forcibly taken to the Queensborough Hospital for Contagious Diseases by officers of the health department. The diagnosticians of the health department stated that the child had infantile paralysis, while a private physician differed in regard to the diagnosis. The mother applied for a writ of habeas corpus and the case was taken to the supreme court, where it was dismissed, Judge Garretson holding that the board of health, in safeguarding the public health, is "clothed with discretionary powers," and that it exercised these properly in forcibly seizing the child. He vindicated Mrs. Anderson, however, stating that she had shown a commendable readiness to comply with the law until confused by conflicting medical opinions. The child was remanded for the full period of quarantine, eight weeks.

OKLAHOMA

Hospital News.—Work has commenced on the $80,000 addition to St. Anthony's Hospital, Oklahoma City.——Hardy Hospital, Ardmore, has recently received gifts amounting to more than $53,000 from Robert Watchorn, at one time commissioner of emigration.——Dr. Loyal M. Martin, Newkirk, has opened a hospital in that place.

Personal.—Dr. Harry H. Cloudman, Oklahoma City, has been reelected athletic director of the city high school.——Dr. Hugh L. Scott, formerly of the National Guard and more recently on duty in Mexico, has been ordered to the Philippine Islands.——Dr. G. Fowler Border, Mangum, mayor of that city, has purchased the *Mangum Star* and the *Greer County Democrat*, which will be consolidated and conducted hereafter under his editorship.

PENNSYLVANIA

State Quarantine Lifted.—Dr. Samuel G. Dixon, state health commissioner, on October 2, lifted the quarantine that has been enforced for the last sixty days to prevent entrance into Pennsylvania of children under 16 years of age. Under the direction of Dr. Dixon more than 1,000 men have been engaged in watching over 100 miles of border. It has been, it was admitted, the most effective and far reaching measure of its kind ever instituted in this state. Cool weather is putting an end to the epidemic and makes quarantine no longer necessary, according to the statement of Dr. Dixon. The quarantine in New Jersey was lifted, October 4. Until October 5, the health reports show that 1,163 cases of infantile paralysis had been reported, beginning with July 1. Eight hundred and seventy-six of these occurred in Philadelphia. Since July 1, 414 deaths have occurred throughout the state from this disease.

Philadelphia

Personal.—Dr. Gwilym G. Davis, professor of orthopedic surgery at the University of Pennsylvania, has been elected to membership in the executive committee of the North American Children's Sanatorium, to fill the vacancy caused by the death of Dr. William L. Rodman. Dr. John B. Carnett was elected chairman of the executive committee.

The University and Jefferson Merger Held Up.—As pointed out in a recent issue of THE JOURNAL, the merger of the University of Pennsylvania and the Jefferson Medical College was postponed for a year. It is now thought that the union which was proposed between the Jefferson Medical College and the Medical Department of the University of Pennsylvania may be indefinitely postponed and that the two schools will in all probability remain on their former independent basis.

CANADA

School of Instruction Opened.—A school of instruction for the Canadian Army Medical Corps was opened at Camp Borden, September 5, under the direction of Capt. Victor H. McWilliams of the Camp Hospital, and a number of officers are taking the courses. There are also nearly 100 accepted applicants at the University of Toronto where Captain McLean is in charge.

Hospital News.—The following Toronto practitioners have been appointed to the staff of the new Military Hospital (old Toronto General Hospital), Toronto: Dr. William B. Thistle, chief of the medical service; Dr. Charles B. Shuttleworth, chief of the surgical service, and Dr. Goldwin W. Howland, chief of the neurologic service. Drs. Gordon Bates, Colin Campbell, Archie C. Campbell, Charles E. Treble, Albert G. Fleming (Toronto Board of Health) have also been added to the staff with the rank of captain.

Personal.—Dr. F. Evelyn Windsor, physician for the Calgary (Alta.) School Board, has been made a member of the Army Medical Corps, and will go to the front on active service.——Col. Herbert A. Bruce, Toronto, recently cabled his resignation of the presidency of the Academy of Medicine. Dr. John Ferguson was elected by the council to the presidency, and Dr. D. J. Gibbs, Wishart, vice president.——Dr. Ferguson gave a dinner for Professor Carlson, Chicago, and members of the academy at the York Club the evening of October 3. Afterward Professor Carlson gave an illustrated lecture on studies on the motility of the stomach and on the gastric juice.——Profs. Irving H. Cameron and John J. Mackenzie will address the Aesculapian Society, Toronto, the evening of October 19, on their experiences at Orpington and Saloniki, respectively.——The following well known Canadian medical men have recently been promoted from lieutenant-colonels to colonels: Herbert S. Birkett, Montreal; James A. Roberts, Toronto; Arthur E. Ross, C. M. G., Kingston; Charles A. Hodgetts, Ottawa; Murray MacLaren, C. M. G., St. John, N. B., and George Acheson, Hamilton, Ont.——Maj. Perry G. Goldsmith, Toronto, has been transferred from the Canadian Eye and Ear Hospital at Folkstone, England, to the Military Hospital, Bramshott.——Dr. Edward Ryan, Kingston, Ont., who has been with the Ontario Military Hospital, Orpington, England, is home on leave of absence but will return about November 1.——Maj. John L. Todd, Montreal, who has been at the front, has been returned to Canada to assist the Dominion Hospitals Commission. He has been appointed one of the three members of the Canadian Pension Board.

GENERAL

Bequests and Donations.—The following bequests and donations have recently been announced:

Hahnemann Hospital, New York, $40,000, by the will of Mrs. Juliet C. Percival.

Roosevelt Hospital, New York, $5,000; Presbyterian Hospital, $7,500; St. John's Guild, $3,000; Manhattan Eye and Ear Hospital, $5,000, and Babies Hospital, $5,000, by the will of Harris Brisbane Dick.

Hospital for Deformities and Joint Diseases, New York, through Dr. Henry W. Frauenthal, a donation from Mr. Herbert Kaufman, Pittsburgh.

Flushing Hospital, New York, a sum sufficient for the endowment of a free bed, by the will of S. Vernon Mann.

St. Elizabeth's Hospital and St. Joseph's Hospital, Chicago, each $5,000, by the will of Mary J. McLaughlin.

Tuberculosis relief work of the Vanderbilt Clinic, $10,000; Department of Tuberculosis of the Presbyterian Hospital, New York, $10,000; Home Hospital for Consumptives conducted by the Association for Improving the Condition of the Poor, $10,000; research work in tuberculosis at the Babbott Memorial Laboratory of the Loomis Sanatorium, Saranac Lake, N. Y., $2,000; Trudeau Foundation, Saranac Lake, N. Y., $2,000; Roentgen Laboratory of St. Joseph's Hospital for Consumptives, New York, $1,000, appropriated by the East River Homes Foundation of New York.

Home for Incurables, New York, $15,000, by the will of Mrs. Emily Thorburn.

Caroline Rest, a home for convalescing mothers and babies at Hartsdale, N. Y., the bulk of his $2,000,000 estate, by the will of George H. Schrader.

Railway Surgeons to Meet.—The tenth annual meeting of the Minneapolis, St. Paul and Sault Ste. Marie Railway Surgical Association will be held at the Hotel Radisson, Minneapolis, December 12 and 13.——The nineteenth annual meeting of the Sante Fe Medical and Surgical Society will be held at Topeka, Kan., October 13 and 14.——The twenty-sixth annual meeting of the New York and New England Association of Railway Surgeons will be held at the Hotel McAlpin, New York, October 18. Dr. William Seaman Bainbridge, New York, will deliver the address in surgery on "The Cancer Problem."——The fourteenth annual meeting of the Surgical Association of the Rock Island lines was held in St. Paul, September 27 and 28, under the presidency of Dr. Samuel C. Plummer. The first day of the meeting was devoted to the reading of papers, and a banquet followed in the evening. On the second day clinics were held in Minneapolis and St. Paul and the Institute of Public Health and Pathology was visited.

New Head for Tuberculosis Society.—At the meeting of the Mississippi Valley Conference on Tuberculosis, held in Louisville, October 4 to 6, Mr. James Minick, Chicago, was elected president; Robert G. Patterson, Columbus, Ohio, vice president, and Dr. Robinson Bosworth, St. Paul, secretary-treasurer.

Army Medical Corps Examination.—The surgeon-general of the army announces that preliminary examination for appointment of first lieutenants in the Army Medical Corps will be held in January, 1917. Full information concerning this examination can be procured on application to the Surgeon-General, U. S. Army, Washington, D. C. There are at present 228 vacancies in the Medical Corps of the army.

Fever Commission Returns.—The Yellow Fever Commission of the Rockefeller Foundation, headed by Maj.-Gen. William C. Gorgas, Surgeon-General, U. S. Army, returned from its tour of investigation in South America, arriving in New York, September 25. The commission has thus far visited Equador, Peru, Colombia and Venezuela. No yellow fever was found excepting at Guayaquil, Equador, where thirty deaths occurred during June and July. October 7, the commission sailed again to study the situation in Eastern South America and the Amazon Valley, and eventually it will go to Mexico and Yucatan.

National Research Council.—In the National Research Council which was appointed by the National Academy of Sciences at the request of President Wilson, the medical profession is represented by Dr. William H. Welch, president of the National Academy of Sciences; Maj.-Gen. William C. Gorgas, Surgeon-General, U. S. Army; Dr. Simon Flexner, director of the Rockefeller Medical Institute, and Dr. Victor C. Vaughan, Ann Arbor, Mich., formerly president of the American Medical Association. The object of the council is to coordinate the scientific research work of the country in order to secure efficiency in the solution of the problems of war and peace.

FOREIGN

Edinburgh University Admits Women.—It is reported that at a meeting held August 28, the Edinburgh University Court decided to admit women students to its medical classes. This decision is especially interesting since when the question came up eight years ago the court voted emphatically against it. The changed viewpoint is doubtless the result of the European war, which has seriously reduced the numbers of male medical students.

Metchnikoff's Ashes in Pasteur Institute.—According to his expressed wishes, the body of Metchnikoff was cremated. The ashes are to be kept in a marble urn beside the ashes of Pasteur in the Pasteur Institute at Paris, the scene of their labors.

Tuberculosis Dispensaries in France.—The German Consul of the Department of the Loire, following instructions from the general government whereby several dispensaries for hygienic measures and protection against tuberculosis must be maintained, has opened the first dispensary at St. Etienne under the direction of a specialist and a certificated nurse. The service is entirely free and the purpose of the regulation and establishment is to produce general and methodical action in the improvement of conditions and reduction in the numbers of tuberculosis cases in housing and working quarters, to aid families of afflicted persons and to afford thorough protection to the community against avoidable infection.

Deaths in the Profession Abroad.—The cable reports the death of A. Magnan, one of the leading alienists of France and authority on matters connected with the internment of the insane.——C. Tiraboschi, assistant in the laboratory at Rome of the national public health service, aged 40. He had published a number of reports of research on transmission of disease by insects and water.——Our Holland exchange reports the death of A. Weil of Wiesbaden, aged 68. It was in 1886 that he called attention to the acute syndrome with jaundice, nephritis and enlargement of the spleen now called by his name. He was professor of pathology and internal medicine at the University of Dorpat for a time but returned to private practice at Wiesbaden in 1893. His works embrace many fields of medicine.——The cable also brings word of the death of V. von Czerny, professor of surgery at the University of Heidelberg since 1877 and chief of the cancer research hospital there, aged 74. He has written many articles on all phases of surgery and the treatment of cancer, and has long been preaching the necessity for state aid for research on the causation of diseases and especially of cancer. In a special plea at an international scientific gathering in 1912 he deplored the negligence of the various governments in this line of activity.

WAR NOTES

Prison Camp Conditions.—As the result of a tour of inspection of East Siberian prison camps undertaken by members of a Red Cross organization, it is reported that at Atchinsk there was no hospital nor even a room for the sick; that at Krasnoyarsk there was a hospital in camp and one in town fitted out by donations, but there was a shortage of foods, instruments and medicine; at the hospital in Godorok 1,116 prisoners had died between October, 1914, and July, 1915; at Kansk the 250 patients had been kept on the floors of four rooms in a brewery and the rations were insufficient and there was a shortage of medicine; at Nijni Udinsk there was only a miserable room for sick prisoners and there were many cases of scurvy due to undernourishment; at Beresowoska there was a hospital on the pavillion system for 600 patients, but this did not satisfy the needs of the camp and nursing and proper food were lacking and in the camp itself there were well provided rooms for the sick, and at Chita there was a military hospital occupying the large barracks of the city with good sanitary arrangements, but insufficient food.

Medicine in War Group System.—In a recent article by Sir Alfred Keogh, director-general of the Army Medical Service, he pays tribute to the preparedness of the medical service of the British army and to the aid given by laboratory workers and the National Research Committee. In addition to the regular corps and nursing service there was a territorial corps and a territorial nursing service with reserves. In addition to the home hospital reserves, it is suggested that it would have made for increased efficiency had there been an inclusive Imperial Army Service instead of a separate service for each unit of the empire.

Want Surgeon at Nice.—Mr. H. W. Bartol, president of the American Hospital at Nice, France, appeals for an American surgeon to take charge of a Red Cross hospital in that city. It is asked that some surgeon be sent out who would be willing to serve six months without compensation, board and lodging being furnished by the hospital. The institution has accommodations for fifty beds and at present forty-nine of these are filled with wounded from the Saloniki front.

OUR TROOPS ON THE BORDER

Field Hospital Ordered Home.—Field Hospital No. 1, Ill. N. G., has been ordered home to be mustered out of the United States service.

Red Cross Unit for the Front.—The Sioux City unit of the American Red Cross, with ten nurses under the direction of Miss Nellie Porter, left, September 11, for service on the Mexican border at Llano Grande, Mexico.

Health Record on the Border.—Capt. Donald Macrae, who went to the border in June with the Iowa Field Hospital Company and was placed in charge of all operative work at the Base Hospital, Brownsville, reports that there has been only one case of typhoid fever and that only one death has occurred, this being from sarcoma of the cecum. There is an average of 400 patients in the hospital, and when it is considered that there are more than 50,000 men both from the regular establishment and the organized militia in this district, the low record for morbidity is remarkable.

PARIS LETTER

PARIS, Sept. 14, 1916.

The War

TRENCH FEVER

Dr. Beauchant communicated to the Réunion médicale de la IV-e armée the history of five patients presenting an unusual clinical type, and one which does not fit any known disease. After a prodromal period of vague malaise lasting for some days, the illness commences suddenly by chills, intense headache, pains in the loins and lower extremities and fever rising rapidly to 40 C. (104 F.). In the first stage, there is a certain amount of prostration, while the headache, lumbar and limb pains persist. These last are the object of special complaint by the patient. Their seat is not in the muscles but in the bones, the tibia being tender in its whole length. These pains are especially severe at night, interfering with sleep; the tongue is moderately furred, there is no diarrhea and no constipation, no exanthem, the spleen is moderately enlarged, there are no chest symptoms, and the liver is normal. At this stage, the fever has a peculiar character. It is polycyclic, rising to about 104 on the first and second day and then falling to normal or very nearly normal; afterward, it rises again to a second maximum, again falling to normal. Sometimes a third rise occurs before an apyrexia lasting some days. This last occurred in the three first cases on the eleventh day; in the fourth on the fifteenth day, and in the fifth case on the twentieth day. One would now be led to believe the disease cured. The patient feels well, and there is but little stiffness in the limbs; the apyrexia does not last. In four or five days a fresh febrile attack occurs, with a sudden rise of temperature to 104 or higher, rigors, more headache, lumbar and limb pains. The duration is short; the temperature falls gradually after two or three days, accompanied by moderate sweating; everything appears to be well when again the same cycle repeats itself. One patient had seven such attacks. The total duration of the illness was considerable, varying between four and ten weeks. Beauchant believes this disease is identical with that which occurred during last winter and summer in Flanders and Artois (THE JOURNAL, Jan. 22, 1916, p. 290), and which has been described under the name of trench fever. It appears to be due to a parasite which has not yet been isolated and which probably lives in the interior of the globules. The disease has been reproduced by the injection of blood or of red blood corpuscles from a patient into a healthy person. The intermediate host is probably the louse.

TRAINING THE LEFT HAND OF CRIPPLES

Training the left hand to produce ambidexterity has been the subject of several successful experiments in the schools of the United States, England and the Scandinavian countries. These results are encouraging from the point of view of vocational education of those victims of the war who have lost their right arm, although it is evident that a late apprenticeship cannot be expected to give the same results as training in childhood. Moreover, in the case of these cripples, there is no question of ambidexterity but of giving to the remaining arm the strength and skill necessary for the acquisition of a trade. In an article published in the *Revue Scientifique*, Mlle. Josefa Joteyko, a lecturer at the Collège de France, who has made a special study of neuromuscular physiology, has attempted to formulate scientific rules for this reeducation of the left hand. The general principle to follow in such cases is to make every attempt to enable the cripple to resume his former occupation. In other words, an endeavor is made to teach the left hand to carry out the movements formerly performed by the right, as experience has shown that practice acquired by one hand helps the other. If one asks a person to write with the left hand he will succeed after several attempts in producing fairly well-formed letters. Moreover, the writing of the left hand presents the same peculiarities as that of the right. It bears the personal imprint by which the authorship of handwriting is recognized. According to Dr. Meige the graphic education of the right upper extremity is reflected in the left limb as a mirror image. The expression "mirror writing" is commonly employed to designate writing which resembles the image of ordinary writing seen in a mirror. In consequence of the bilateral symmetry of the body, mirror writing may be considered as the normal physiologic writing of the left hand. By analogy the term "mirror movements" has been applied to movements executed by the left hand in a sense inverse to those executed by the right. These are the most natural and the easiest to carry out. Mlle. Joteyko believes that the explanation of a certain number of failures in the education of the left hand is that this hand has been required to perform movements superposable on those of the right hand and therefore, in general, contrary to its special aptitudes. She, therefore, deduced the following rule: In training the left hand for a trade, movements should follow the laws of bilateral symmetry; that is to say, the left hand should not be made to copy the right hand but to carry out the movements of the latter in an inverse direction. This rule should prevail, not only in educating the left hand to do work previously executed by the right, but also in learning a new trade. Can this education of the left hand be applied to all trades? Mlle. Joteyko concludes from her unpublished experiments that intensive work of the left hand produces more considerable effect on the heart than that of the right. Therefore, it must be concluded that the use of the left hand cannot be extended to all trades because of injurious effects on the heart. Physicians, therefore, should examine the hearts of cripples and recommend a change of trade when left-handed work causes too great a strain on that organ.

FOR THE PROFESSIONAL REEDUCATION OF WAR CRIPPLES

The chamber of commerce of Troyes has taken up the subject of war cripples in connection with the local industry, hosiery. There is a shortage of labor in this line, and the chamber has decided to open a competition for the making of artificial arms and hands especially adapted to the hosiery industry. A commission composed of employers and hosiery workers as well as orthopedic specialists has just been constituted. These instructions are to establish the conditions for such a manufacture by defining the movements necessary for the control of hosiery looms so that the artificial hands may serve the purpose for which they are designated. It is intended to offer a valuable prize in this competition. For this purpose a subscription list has been opened by the chamber, which has subscribed 1,000 francs ($193).

Vocational reeducation is being actively pushed at the physiotherapy establishment at Troyes, and the work will be carried on continuously through the creation of a regional school of reapprenticeship to which the syndical chamber of hosiery and the chamber of commerce have promised their support. The hosiery works of Troyes have accommodation for 1,000 cripples.

CANADIAN MILITARY SURGEONS IN PARIS

The Canadian military surgeons in France who serve in the medical formations created by their compatriots have founded an association of which the Parisian section (Canadian Hospital of the Entrenched Camp of Paris) held its solemn inauguration in the grand amphitheater of the Faculté de médecine. Professor Landouzy, dean of the faculté, presided over this ceremony. Dr. Albee of New York, honorary member of the Association des médecins militaires du Canada, and at present surgeon of the hospital of Ris-Orangis, was a guest of this meeting. Captain Pariseau, radiologist of the Canadian Hospital of Saint-Cloud, explained before this meeting Dr. Albee's method of bone grafts.

THE GOLDEN BOOK OF MEDICINE

The Société de pathologie comparée has placed on sale for the benefit of works of charity (Comité de secours anglo-franco-belge et Caisse d'assistance médicale de guerre) the second illustrated instalment of the Livre d'or de la grande famille médicale (The Golden Book of the Great Medical Family) containing the names of those dead on the field of honor, mentioned in dispatches, named for the Legion of Honor, or who have obtained military medals.

CONVALESCENT OFFICERS ON THE BORDERS OF LAKE GARDA

The mayors of the towns situated on the borders of Lake Garda in Italy have held a meeting to examine a proposition formed by the allied governments that convalescent officers should be sent to this region. This initiative has been supported by the chambers of commerce of Paris, London and Petrograd, and has obtained the help of the General Direction of the Railways. After a short discussion, the mayors unanimously voted their acceptance of the proposition.

THE AMERICAN HOSPITAL ON THE SERBIAN FRONT

Under the auspices of the commission for coordination of auxiliary service of the armies of the East, a surgical hospital has been installed quite close to the Balkan front, especially devoted to the wounded of the Serbian armies. This hospital, provided with all recent improvements, is almost entirely due to generous contributions of Americans (The American Relief Clearing House), who have given 200 complete beds, the operating theater, roentgenographic and roentgenoscopic installations, electrovibrator, Carrel-Dakin apparatus, etc. Therefore, the commission of coordination of the direction of the Serbian sanitary service of health have given to this model formation the name of the "American Hospital of the second Serbian Army."

The League for the Increase of the French Birth Rate

A league has just been constituted under the presidency of Mr. Paul Bureau, professor at the Faculté libre de droit de Paris and at the Ecole des hautes études sociales, to unite all citizens who are conscious of the peril which their country runs in consequence of birth control, and who desire to assure the progressive increase of its population. This group intends to devote itself to a campaign of moral education intended to bring home to each citizen the duties imposed on him by the necessity for the perpetuation of the race. The tragic circumstances of the present time render this duty imperative. The headquarters of the league are at 85 Richelieu Street, Paris.

Marriages

SAMUEL PRITCHARD FETTER, M.D., Portsmouth, Ohio, to Mrs. Gertie Meek Mayo of Paintsville, Ky., at Ashland, Ky., September 23.

FRANK CURTISS DAVIS, M.D., Lewistown, Mont., to Miss Frieda Ullig of Vienna, Austria, at Lewistown, September 25.

SUMNER CHEEVER ANDREWS, M.D., Gloucester, Mass., to Miss Hilda Simmons of Waldo, Ark., about September 28.

HENRY CHARLES SCHMITZ, M.D., Marshalltown, Iowa, to Miss Margaret Alice Rourke of Sterling, Ill., October 10.

P. A. SURG. ROBERT OLESEN, U. S. P. H. S., Pittsburgh, to Miss Florence Watson of River Forest, Ill., October 6.

WILLIAM G. WOOD, JR., M.D., St. Louis, to Miss Ida Heidbrink of Maplewood, Mo., at St. Louis, September 23.

EDWARD CARL GAEBE, M.D., Halliday, N. D., to Miss Iva Dell Larson of New Salem, N. D., September 28.

KIMBALL BANNISTER, M.D., Phoenix, Ariz., to Miss Elizabeth Clayton Davis of Milwaukee, September 23.

CHARLES BRADLEY PINKHAM, M.D., to Miss May Agnes Austin, both of San Francisco, September 27.

HENRY BLAKESLEE BOYDEN, M.D., Grand Island, Neb., to Miss Eva Brix of Omaha, September 20.

EUGENE LINDSAY OPIE, M.D., St. Louis, to Miss Margaret Simpson of Toronto, Ont., September 16.

JAY CLAUDE SIMMONS, M.D., Norris, Ill., to Miss Rachel Cattron of Fairview, Ill., September 27.

WILLIAM FORD, M.D., Morea, Pa., to Miss Rose Straub of Ashland, Pa., at Buffalo, September 18.

CHARLES C. JONES, M.D., Comfort, Texas, to Miss Dove McElroy of Oklahoma City, October 1.

ANTHONY MATHIAS DRUMMY, M.D., Lincoln, Ill., to Miss Nora Ryan of Paxton, Ill., October 4.

W. FRANK GEMMILL, M.D., Woodbine, Pa., to Miss L. Evis Waters of Norfolk, Va., September 25.

JASON W. ALBAUGH, M.D., to Miss Ruth Long, both of Mingo Junction, Ohio, September 18.

JOSEPH J. SARAZIN, M.D., to Miss Ethelwyn Trevor Boydell, both of Nyssa, Ore., September 20.

Deaths

Harry Huston Whitcomb, M.D., Norristown, Pa.; University of Pennsylvania, Philadelphia, 1880; aged 60; a Fellow of the American Medical Association; formerly vice president of the Medical Society of the State of Pennsylvania and of the Norristown Board of Health; consulting physician to the State Hospital for the Insane; surgeon of Charity Hospital and St. Joseph's Protectory; secretary of the Montgomery County Medical Society and a member of the state board of health; died in Atlantic City, N. J., September 28, from angina pectoris.

Arthur William Tanner, M.D., Moosomin, Sask.; University of Toronto, Ont., 1899; aged 44; for six years a member of the town council and for two years mayor of Moosomin; lieutenant-colonel in the Canadian Army Medical Corps; in command of No. 10 Field Company, Canadian expeditionary forces in France; while advancing to a dressing station, June 3, was struck by a shell and killed.

William H. Barry, M.D., Hot Springs, Ark.; Memphis (Tenn.) Medical College, 1858; aged 80; a pioneer practitioner of Hot Springs; formerly president of the Arkansas State Medical Society; founder and chief surgeon of the Barry Hospital; a Confederate veteran; for many years a member of the city council and organizer of the first board of health; died at his home, September 26.

John Lester Keep, M.D., Brooklyn; Hahnemann Medical College, Philadelphia, 1860; New York Homeopathic Medical College, New York, 1866; aged 79; medical director of the Gates Avenue Dispensary; surgeon of the Thirteenth Infantry, N. G., N. Y., in 1868 and in 1883 made colonel, attached to the Second Division; died from heart disease at his summer home at Shelter Island, N. Y., September 30.

Josiah Coloman Haney, M.D., Dalton, Ohio; Ohio Medical University, Columbus, 1895; aged 50; a Fellow of the American Medical Association and a well known practitioner of Wayne County, Ohio; while driving over a grade crossing of the Wheeling and Lake Erie Railroad near East Greenville in his automobile, September 23, was struck by a locomotive and instantly killed.

Albert Currier Buswell, M.D., Epping, N. H.; Medical School of Maine, Brunswick, 1878; aged 63; a member of the New Hampshire Medical Society; formerly chairman of the Epping Board of Health; once president of the Rockingham County Medical Society; died at his home, August 12, from diabetes associated with tuberculosis of the lungs.

Ernest E. Hamilton, M.D., Wichita, Kan.; University of Michigan, Ann Arbor, 1879; aged 60; a Fellow of the American Medical Association; a specialist on diseases of the eye, ear, nose and throat; local oculist for the Missouri Pacific and Frisco systems; died suddenly from heart disease, while taking lunch at the Wayside Inn, Drury, September 29.

John Archibald McLeod, M.D., Milwaukee, Wis.; University of Michigan, Ann Arbor, 1878; aged 61; for several years a practitioner of Ironwood, Mich.; surgeon and acting brigade surgeon, Michigan National Guard; one of the organizers of the First National Bank of Ironwood; died suddenly at his home, September 21.

John Vernon Solandt, M.D., Hayden, Colo.; Gross Medical College, Denver, 1898; aged 46; a member of the Colorado State Medical Society and in 1913 president of the Routt County Medical Society; was instantly killed by the overturning of his automobile, September 26, while on his way to make a professional call at Steamboat Springs.

George Brinton Wilson, M.D., Captain and Medical Director, U. S. Navy; Dartmouth Medical School, Hanover, N. H., 1889; aged 53; commandant of the U. S. Naval Hospital, Chelsea, Boston; died in that institution, October 1, after eleven years and eleven months' sea service and thirteen years, two months' shore or other duty.

James Y. Shearer, M.D., Reading, Pa.; Jefferson Medical College, 1862; aged 79; a Fellow of the American Medical Association and for fifty-two years a practitioner of Sinking Springs, Pa.; once president of the Berks County Medical Society; died at his home, September 23, from arteriosclerosis.

Bishop Asbury Rose, M.D., Linton, Ind.; Medical College of Ohio, Cincinnati, 1875; aged 66; formerly a Fellow of the American Medical Association; a member of the Indiana State Medical Association; died at his home, September 25, from diabetes.

William D. Moore, M.D., Philadelphia; University of Pennsylvania, Philadelphia, 1893; aged 49; formerly a Fellow of the American Medical Association; also a graduate in pharmacy; died at his home in Germantown, Philadelphia, September 27, from heart disease.

Cecil L. Hudgins, M.D., Olive Hill, Ky.; St. Louis College of Physicians and Surgeons, 1889; aged 59; a Fellow of the American Medical Association; local surgeon of the Chesapeake and Ohio System for many years; died at his home, September 28, from arteriosclerosis.

Robert M. Hill, Farmington, Pa. (license, years of practice, Fayette County, Pa., 1881); aged 74; for two terms a member of the assembly from Fayette County; a veteran of the Civil War; died suddenly from cerebral hemorrhage, while visiting in Dawson, Pa., September 21.

James H. Callahan, M.D., Carthage, Ill.; Bellevue Hospital Medical College, 1870; aged 72; formerly a member of the Illinois State Medical Society, and president in 1913 of the Hancock County Medical Society; died at the home of his daughter in Cedar Rapids, Iowa, September 22.

George W. Boerstler, M.D., Lancaster, Ohio; University of Wooster, Cleveland, 1867; aged 70; a Fellow of the American Medical Association and one of the oldest and most prominent practitioners of Fairfield County; died at his home, September 19, from cerebral hemorrhage.

William H. Begg, M.D., Columbus Grove, Ohio; Medical College of Ohio, Cincinnati, 1881; aged 63; formerly a Fellow of the American Medical Association; a member of the Ohio State Medical Association; died at his home, July 26, from mitral insufficiency.

Charles **Roy Armstrong, M.D.,** Thorntown, Ind.; Homeopathic Medical College of Missouri, St. Louis, 1896; aged 42; died in St. Elizabeth's Hospital, Lafayette, Ind., September 21, three days after an operation for appendicitis.

Frank Webster, M.D., Dayton, Ohio; Pulte Medical College, Cincinnati, 1882; aged 62; for many years a member of the staff of the Miami Valley Hospital; died at his home, September 21, from heart disease.

Harry **Carpenter Weber, M.D.,** Louisville, Ky.; Kentucky School of Medicine, Louisville, 1898; aged 46; a member of the Kentucky State Medical Association; a specialist in urology; died at his home, October 6, from uremia.

Baldwin Berne Scott, M.D., Mt. Vernon, Ohio; University of Wooster, Cleveland, 1876; aged 67; at one time secretary of the Knox County Medical Society; died at his home, September 19, from heart disease.

Adam Miller, M.D., Jordanville, N. Y.; Geneva (N. Y.) Medical College, 1844; aged 97; surgeon of volunteers during the Civil War; and at one time superintendent of schools for the town of Warren; died at his home, September 28.

Luther J. Ingersoll, M.D., Denver; Homeopathic Medical College of Missouri, St. Louis, 1875; aged 78; a practitioner of Denver; died at his home, September 19, from cerebral hemorrhage.

Paul W. Fayn, M.D., St. Louis; St. Louis College of Physicians and Surgeons, 1900; an advertising specialist; died at Shellyville, Mo., September 13, it is said from an overdose of cocain.

James Evans, M.D., Burlington Junction, Mo.; College of Physicians and Surgeons, Keokuk, Iowa, 1879; aged 83; who was operated on in St. Joseph, September 4, died in the Noyes Hospital in that city, September 14.

Albert W. Cochran, M.D., Hammonton, N. J., and Charlottesville, Pa.; Medico-Chirurgical College of Philadelphia, 1886; aged 63; died suddenly at the home of his daughter in Fitchburg, Mass., September 15, from heart disease.

John Bell Whitehead, M.D., Lovingston, Va.; Gate City Medical College, Texarkana, Texas, 1902; aged 72; died at his home, September 5.

Elmer Morton Druley, M.D., Centerville, Ind.; Eclectic Medical Institute, Cincinnati, 1891; aged 52; died at his home, July 18, from paresis.

Samuel J. Tilden Carswell, M.D., Jacksonville, Fla.; Medical College of Georgia, Augusta, 1900; aged 40; died at his home, September 14.

Aaron J. King, M.D., Atlanta, Ga.; Southern Medical College, Atlanta, 1895; aged 68; died in a hospital in Atlanta, September 8.

Reuben Marshall, M.D., Cowan, Ind.; Miami Medical College, Cincinnati, 1876; aged 76; died at his home, July 10.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

NAPHTHALENE IN GASOLINE FOR AUTOMOBILES

To the Editor:—Your note "Naphthalene in Gasoline for Automobiles," THE JOURNAL, September 16, p. 897, is to the point. There is another aspect to the question, however, which may be of interest to your readers who own cars, and some of whom might feel inclined to experiment with naphthalene, or as you suggest, moth balls.

The present day automobile engines are constructed for the use of liquid fuels of comparatively low boiling points. In the fractional distillation as usually carried out for the testing of gasoline the final boiling point of most brands is near or under 175 C. The higher this final boiling point, the greater will be the tendency to incomplete combustion and consequent carbon formation in the cylinders.

It is plain that the presence of naphthalene (boiling at 218 C.) and similar compounds in gasoline will be disadvantageous in this respect. There may be "quiet, smooth, easy running" for a while, but then most of the "augmented power" may crop out in the owners temper when he finds his cylinders clogged up "in a jiffy." Naphthalene, etc.—whether as moth balls or otherwise—in an appropriate vehicle are all right for Diesel engines, but they are liable to cause indigestion when fed to the average automobile.

F. W. L. TYDEMAN, M.D., Martinez, Calif.

BRAINS AS A DEPILATORY

To the Editor:—Will you explain this phenomenon: "When the raw or fleshy side of the hide of a deer or squirrel is rubbed vigorously with the fresh brains of the same animal, and the same side exposed to a temperature of 150 degrees (dry heat), the hair can very readily be removed by scraping the same, thus acting as a depilatory." This is the method of dressing hides used by the Indians of the West.

HUNTER.

ANSWER.—Our correspondent asks us to "explain this phenomenon," which he quotes. Before explaining the "phenomenon," we should want to be quite sure that it exists. It sounds very much like the superstition in regard to planting this, that or the other "garden truck" in the "dark" or the "light" of the moon. It is quite possible that the Indians of today, some of them at least, would know when the temperature reached 150 degrees. The loosening of the hair previous to tanning by partial putrefaction of the epidermis is a known process, sometimes called sweating. In this the fleshy side of the hide is salted or treated with crude acetic acid. It is possible that the loosening of the hair on the hides under the condition mentioned is simply due to partial putrefaction of the epidermis. The brain tissue contains lipoid substance and moisture. It would make a fairly good culture medium because of its fatty content. It would also be protective and so facilitate the growth of certain anaerobic bacteria which cause putrefaction. Using the "fresh brains from the same animal" would be the natural thing to do, because they would be handy, especially to the Indian.

ETIOLOGY OF RHUS POISONING

To the Editor:—Relative to the Current Comment on "The Poisonous Principle of Poison Oak" (THE JOURNAL, Aug. 5, 1916, p. 441) and the communication of Dr. Leland (Queries and Minor Notes, Sept. 2, 1916, p. 763), allow me to state that I have made a careful research of the etiology of rhus poisoning covering the past two years, and have collected somewhat more than 100 reports of cases in my own practice and in that of other physicians. From the study of these I am driven to take issue with the answer to the query of Dr. Leland, which in effect denies the occurrence, except in very rare instances, of poisoning by this plant *without contact*. I have several very detailed histories of cases in which all possible contacts through clothing, or delayed and latent poisoning by other adventitious means, were beyond question eliminated. Consideration of the possibilities in the etiology, together with studies of the bacteria always found on the leaves of the rhus plants, has forced me to lay less stress on the rôle of the active principle, toxicodendrol, and to assign to these bacteria an active agency in the etiology. The subject is one which calls for an open mind and special laboratory investigation. I should be very glad to hear from any workers in this field.

LOWELL C. FROST, M.D., Beverly Hills, Calif.

Credulity.—Man is a dupable animal. Quacks in medicine, quacks in religion, and quacks in politics know this and act on that knowledge. There is scarcely any one who may not, like a trout, be taken by tickling.—Robert Southey.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

Arkansas: Regular, Little Rock, Nov. 14. Sec., Dr. T. J. Stout, Brinkley; Homeopathic, Little Rock, Nov. 13. Sec., Dr. Scott C. Runnels, 980 Scott St., Little Rock; Eclectic, Little Rock, Nov. 14. Sec., Dr. C. E. Laws, 712 Garrison Ave., Fort Smith.

Connecticut: Homeopathic, New Haven, Nov. 14. Sec., Dr. E. C. M. Hall, 82 Grand Ave., New Haven; Eclectic, New Haven, Nov. 14. Sec., Dr. T. S. Hodge, 19 Main St., Torrington.

Florida: Homeopathic, Jacksonville, Nov. 10. Sec., Dr. J. B. Griffin, St. Augustine.

Iowa: Des Moines, Oct. 17-19. Sec., Dr. Guilford H. Sumner, State House, Des Moines.

Maine: Portland, Nov. 14-15. Sec., Dr. Frank W. Searle, 776 Congress St., Portland.

Massachusetts: Boston, Nov. 14-16. Sec., Dr. Walter P. Bowers, Room 501, No. 1 Beacon St., Boston.

Mississippi: Jackson, Oct. 24-25. Sec., Dr. J. D. Gilleylen, Jackson.

Nevada: Carson City, Nov. 6. Sec., Dr. S. L. Lee, Carson City.

New Jersey: Trenton, Oct. 17-18. Sec., Dr. Alexander MacAlister, 438 E. State St., Trenton.

South Carolina: Columbia, Nov. 14. Sec., Dr. A. Earle Boozer, 1806 Hampton St., Columbia.

Texas: Fort Worth, Nov. 14-16. Sec., Dr. J. S. McCelvey, Temple State Bank Bldg., Temple.

West Virginia: Parkersburg, Nov. 14. Sec., Dr. S. L. Jepson, State Health Commissioner, Charleston.

Medical Colleges Not Accredited in Missouri

According to the official bulletin of the Missouri State Board of Health, the board at a meeting, held July 17, 1916, by unanimous vote declared that after that date the following medical schools would not be accredited:

College of Physicians and Surgeons, San Francisco.
College of Medical Evangelists, Loma Linda, Calif.
Georgia College of Eclectic Medicine and Surgery, Atlanta, Ga.
Chicago Hospital College of Medicine, Chicago.
Jenner Medical College, Chicago.
College of Physicians and Surgeons, Boston.
Lincoln Medical College, Lincoln, Neb.
New York Medical College and Hospital for Women, New York City.
Ohio State University, College of Homeopathic Medicine, Columbus, O.

The board at previous meetings had taken similar action regarding:

Southwest School of Medicine and Hospital, Kansas City, Mo.
Eclectic Medical University, Kansas City, Mo.
University of West Tennessee, Medical Department, Memphis, Tenn.

A New Medical School in India

A new medical school, the Belgachia Medical College, is reported[1] as having been formally opened in July, 1916, at Belgachia, a suburb of Calcutta, India. It is said to be "the first medical college in Bengal organized by private enterprise and managed entirely by Bengali medical men." Instruction is in the English language, the course extends over five years, and the curriculum agrees with that for the Bachelor of Medicine degree of the University of Calcutta, with which it is in affiliation. It is said to have ample buildings and fair hospital and dispensary facilities, and it has government recognition. Its enrolment of students is limited, since it is reported that 725 students applied for admission last year but there were only 137 vacancies.

It is said that the main purpose of the government medical colleges, of which there are five in India, is to provide officers for the public services and that they are not adequate to supply the medical practitioners needed by the native population of India. Previous efforts were made to establish private medical schools, but, owing to lack of funds and suitable accommodations, they failed, since government recognition was not granted to them.

This new medical school is evidently the result of years of effort. It was organized in 1887 under great difficulties as the Calcutta Medical College. It was not permitted to have dissecting done, nor could it carry on clinical instruction since it had neither hospital nor dispensary. The following year limited access was obtained to a native hospital, and in its second year permission for dissection was secured. In 1897 a fifteen-bed hospital was provided, and five years later it opened a forty-bed hospital at Belgachia, its present location. In 1904 it absorbed the College of Physicians and Surgeons, another private, unrecognized medical school. It has since received liberal financial support from the government, the municipality, the University of Calcutta, and from influential and wealthy natives of India. The result was the opening in July of the reorganized medical college, which has received recognition by the government.

1. The Belgachian Medical College, Brit. Med. Jour., Sept. 2, 1916, page 337.

New York May Report

Mr. H. H. Horner, Chief, Examinations Division of the New York State Board of Medical Examiners, reports the written examination held at Albany, Buffalo, New York and Syracuse, May 16-19, 1916. The total number of subjects examined in was 8; total number of questions asked, 80; percentage required to pass, 75. The total number of candidates examined was 59, of whom 47 passed and 12 failed. Three candidates were licensed through reciprocity, and four were granted reregistration licenses. The following colleges were represented:

College	Year Grad.	Total No. Licensed
PASSED		
Leland Stanford Junior University	(1914)	1
University of California	(1900)	1
Georgetown University	(1913)	1
George Washington University	(1915)	1
Tulane University of Louisiana	(1914)	1
College of Physicians and Surgeons, Baltimore	(1914)	1
Johns Hopkins University	(1914) (1915)	2
Albany Medical College	(1902) (1914, 3) (1915)	5
Columbia Univ., Coll. of Phys. and Surgs.	(1913) (1915, 2)	3
Cornell University	(1915)	2
Fordham University	(1914) (1915)	2
Long Island College Hospital	(1911) (1914) (1915)	3
New York Homeo. Med. Coll. and Flower Hosp.	(1914, 2) (1915, 3)	5
New York Med. Coll. and Hosp. for Women	(1915)	1
Syracuse University	(1915)	2
Univ. and Bellevue Hosp. Med. College	(1914, 2) (1915, 2)	4
University of Cincinnati	(1911)	1
Jefferson Medical College	(1912) (1913)	2
Medico-Chirurgical College of Philadelphia	(1915)	1
University of Pennsylvania	(1902) (1912)	2
University of Vermont	(1914) (1915, 2)	3
University of Virginia	(1914)	1
University of Toronto	(1916)	1
University of Naples	(1905)	1
FAILED		
Howard University	(1916)	1
Northwestern University	(1896)	1
Boston University	(1915)	1
Albany Medical College	(1911) (1915)	2
Columbia University, Coll. of Phys. and Surgs.	(1914)	1
New York Homeo. Med. Coll. and Flower Hosp.	(1914) (1915)	2
University of Buffalo	(1913)	1
University of Nashville	(1906)	1
University of Turin	(1892) (1914)	2

College	Year Grad.	Reciprocity with
LICENSED THROUGH RECIPROCITY		
New York Homeo. Med. Coll. and Flower Hosp.	(1914)	New Jersey
Medical College of Ohio	(1907)	Ohio
University of Virginia	(1913)	Virginia

Louisiana June Report

Dr. E. L. Leckert, secretary of the Louisiana State Board of Medical Examiners, reports the written examination held at New Orleans, June 8-10, 1916. The total number of subjects examined in was 11; total number of questions asked, 100; percentage required to pass, 75. The total number of candidates examined was 60, of whom 52 passed and 8 failed. Four candidates were licensed through reciprocity. The following colleges were represented:

College	Year Grad.	Per Cent.
PASSED		
Howard University	(1914)	80.9
Bennett Medical College	(1915)	88.7
Tulane University of Louisiana	(1910) 77.4; (1915) 79.3, 85.8; (1916) 81, 81.8, 82.4, 82.5, 82.7, 84.5, 85.3, 85.5, 85.7, 85.7, 86.3, 86.7, 86.8, 86.8, 87, 87, 87.2, 87.5, 87.6, 87.6, 87.7, 87.9, 88.1, 88.2, 88.3, 88.4, 88.4, 88.6, 88.7, 88.8, 89.3, 89.4, 89.4, 89.6, 89.6, 89.7, 89.8, 89.9, 90.5, 90.8, 91, 91.2, 91.6	
Hahnemann Med. College and Hospital, Philadelphia	(1914)	84.6
Meharry Medical College	(1916)	75.6
Baylor University	(1911) 82.7; (1912)	79.6
FAILED		
University of Alabama	(1907)	70.7
College of Physicians and Surgeons, Memphis	(1911)	56.7
Memphis Hosp. Med. Coll.	(1908) 68.6; (1910) 67.5; (1911)	73.1
University of Tennessee	(1913) 66.3, 73.9; (1914)	72.8

College	Year Grad.	Reciprocity with
LICENSED THROUGH RECIPROCITY		
Atlanta Medical College	(1915)	Georgia
College of Physicians and Surgeons, Keokuk	(1888)	Illinois
University of Maryland	(1911)	Maryland
University of Tennessee	(1915)	Arkansas

Book Notices

THE DREAM PROBLEM. By Dr. A. E. Maeder. Authorized translation by Drs. Frank Mead Hallock and Smith Ely Jelliffe. Paper. Price, 60 cents. Nervous and Mental Disease Monograph Series No. 22. New York: The Nervous and Mental Disease Publishing Company, 1916.

Maeder presents the subject as an expression of personal conviction, but his views are suited to show the existing differences in opinion between the Vienna and Zurich schools of psychanalysis. He believes that no real or necessary differences exist between them, as the things accomplished by the Zurich school have been the natural outcome of what Freud gave them. According to his conception, the axiom that the dream is a wish fulfilment "is too indefinite and especially one sided, for it actually fails to embrace the important teleological side of the unconscious function." He assumes two functions of the dream, the cathartic action, on the unloading of the emotion, on which the chief stress has been laid up to date, and the preparing function, the overcoming of the conflict, the real freeing by means of sublimation. In the interpretation of the latter function, Maeder attaches a greater importance to the manifest dream content than Freud. The conception of the dream as a wish fulfilment contains only the regressive side of the phenomenon, and is an expression of the "pleasure principle," whereas the preparing function indicates the progressive form of the activity of the libido and is the expression of the "reality principle." The principal idea of a former contested article of Maeder is, "In the dream there is at work a preparatory arranging function which belongs to the work of adjustment." This expresses clearly his point of view on the reality principle. In presenting this subject, Maeder gives some good dream analyses and discusses the significance of the manifest dream content, the dream in its psychic environment, types of dreams, and the tendencies of the Vienna and Zurich schools in psychanalysis. The monograph is written clearly and concisely, and by its lack of ambiguity shows Maeder's grasp of the situation. Too many references to further publications and a forthcoming book strike a discordant note.

THE AMERICAN ENCYCLOPEDIA AND DICTIONARY OF OPHTHALMOLOGY. Edited by Casey A. Wood, M.D., C.M., D.C.L., Professor of Ophthalmology and Head of Department, College of Medicine, University of Illinois. Volume 9—Institutions for the Blind to Lemotes. Cloth. Price, $6. Pp. 6419 to 7190, with illustrations. Chicago: Cleveland Press, 1916.

The American Encyclopedia of Ophthalmology shows no lowering, but rather a raising, of its standard, in Volume IX. Judging by the past rate of progression, this monumental work will run to twelve or fourteen volumes. Among the more important articles in the present volume are: "Institutions for the Blind" (concluded) by Charles F. F. Campbell, by far the best of all the books or articles on this subject in any language; "Intracranial Organs of Vision," by Carl Dudley Camp; "Iritis" by Charles P. Small; "Krönlein's Operation," by the editor, and the series of articles on the various forms of keratitis, by Joseph D. Lewis. The article on "Lacrimal Apparatus," by Howard F. Hansell, is especially clear, succinct and practical. The longest article is one of 147 pages by Thomas Hall Shastid, entitled "Legal Relations of Ophthalmology," a subject which, as the editor declares in a footnote, was first developed by Dr. Shastid. This article exhibits the results of untiring industry, as well as a wide and accurate knowledge of both law and medicine. Once again, the only fault which could properly be found with the encyclopedia is an occasional overinclusion, or minor omission. For example, under the definition of Colles' law, a statement should have been added to the effect that this law is no longer regarded as correct in its old form, the reason that a mother is not infected by her child being that she has syphilis already.

The publisher, the editor and the collaborators who are responsible for the American Encyclopedia of Ophthalmology are to be congratulated.

Miscellany

The Scope and Function of the U. S. Pharmacopeia and National Formulary

In a review of the National Formulary in the August number of the *Journal of the American Pharmaceutical Association*, Mr. Wilbur L. Scoville of Parke, Davis & Co. makes some statements concerning the U. S. Pharmacopeia and the National Formulary. Mr. Scoville is not a member of the Revision Committee of the U. S. Pharmacopeia, and therefore it is presumable that he erred through ignorance of the facts rather than through intention. He says in part:

"There is one very essential difference between the Pharmacopeia and the National Formulary which will keep them distinct and will avoid conflict. The Pharmacopeia is an authority on therapeutics, and its scope is controlled by therapeutic considerations, but the National Formulary does not vouch for any therapeutic efficiency, and recognizes any preparation of pharmaceutical soundness which is used to a marked extent by physicians.

"The Pharmacopeia is controlled by the 'regular' school of practice, but the National Formulary makes no distinction between allopaths, homeopaths, osteopaths, chiropractors or any other school of practice. Its mission is to perfect or select the pharmaceutical qualities of the formulas, and to allow the physicians as a whole to adjust or judge the therapeutics. Hence there is not likely to develop any rivalry or antagonism between the two books."

In the September number of the *Journal of the American Pharmaceutical Association*, Dr. Oliver T. Osborne, a member of the Committee of Revision of the U. S. Pharmacopeia, replies to some of the statements made by Mr. Scoville. He says in part:

"In the first place, the Pharmacopeia is not an authority on therapeutics, and it was repeatedly and distinctly so stated and so urged in various discussions held by the Subcommittee on Scope, a component part of the Revision Committee of the Pharmacopeia. I was a strong advocate that a drug which was therapeutically useless should not enter the ninth revision of the United States Pharmacopeia, but I was repeatedly and permanently outvoted, those who differed from me voting for the principle that the United States Pharmacopeia was 'not a book on therapeutics.' The Subcommittee on Scope, consisting of nine members, passed a 'guiding principle' that a drug to be admitted to the United States Pharmacopeia should be of 'therapeutic usefulness' or of 'pharmaceutic necessity.'

"On the floor of the Pharmacopeial Convention held in 1910, it was stated that it was the duty of physicians to select the drugs, and the duty of pharmacists to decide how the preparations of the drug should be made. Neither was this obviously correct division of labor lived up to, nor were the 'guiding principles' of the Subcommittee on Scope lived up to.

"Of the fifty members of the Revision Committee only six were physicians engaged in the practice of medicine, and four of these physicians were members of the Subcommittee on Scope. Basing their recommendations on the fact that very many drugs and preparations in the Pharmacopeia of 1900 were therapeutically useless, this Subcommittee on Scope recommended the deletion of more than 150 drugs and preparations, and more than half of these drugs and preparations were recommended for the Pharmacopeia by the Executive Committee, only one member of which was a practicing physician. This all-powerful Executive Committee also introduced into the Pharmacopeia drugs that had not even been passed upon by the Subcommittee on Scope. In other words, the votes, advice and decision of the hard-working Subcommittee on Scope, aiming at therapeutic usefulness of drugs that should enter the new Pharmacopeia, were largely turned down, overruled and overvoted by the Executive Committee (an all-powerful committee that passed on all recommendations of the subcommittees), and only one member of this Executive Committee is a practicing physician, and therefore the only one qualified to pass upon the therapeutic value of a drug or preparation. Hence the reasons that more than half of the drugs and preparations recommended for deletion

by the Subcommittee on Scope, and introduced into the Pharmacopeia by the Executive Committee, in spite of such deletion recommendation, were not therapeutic reasons. Therefore the book is *not* an authority on therapeutics and was not intended to be such. In fact, it is a book of valuable therapeutic drugs interspersed with several hundred drugs and preparations that are either useless or inferior to the few that are of value.

"A drug, to have therapeutic value, must have some recognized activity on the human body. A very large number of those in the new Pharmacopeia have no such activity. Even the doses of the drugs are not authoritative, only suggestive. The dose of a drug is enough to produce the results required, more or less than the dose suggested by the Pharmacopeia.

"That the Pharmacopeia is controlled by so-called "regulars" is another statement that is not a fact. Only four members of the Executive Committee, which committee is *entirely responsible* for the contents of the Pharmacopeia, have the degree of M.D. Hence the book represents the drugs and preparations that the expert drug men in all branches of the drug traffic desire to have in the book.

"Also, one cannot well see how those who use no drugs in the treatment of disease could be interested in a book on drugs. Therefore, to intimate that such were shut out of the United States Pharmacopeia is a reflection on their supposedly drugless practice, and criticism cannot be made of the Revision Committee, thirty-two of whose fifty members are drug experts.

"Exactly how the so-called osteopaths, their pseudo friends, the chiropractors, and 'other schools of practice,' perhaps mental and Christian scientists, i. e., drugless treaters of disease, can or will find the fourth revision of the National Formulary useful, is a question in psychology. And also it should be remembered that the state medical laws prohibit these sects from giving or prescribing drugs."

Homologous Serotherapy in Poliomyelitis

A. Netter has called attention to the therapeutic value of the serum from persons who have recovered from poliomyelitis in treatment of fresh cases of the disease. He now has a record of 34 patients thus treated, and he reports that 8 were completely cure, 3 almost completely, 9 were materially improved and 3 somewhat improved. In 3 cases no influence was apparent and 8 died. In the 2 latest cases the poliomyelitis developed with symptoms suggesting cerebrospinal meningitis. The first signs of paralysis were noticed the third and the fifth days, and the serotherapy was commenced in less than forty-eight hours thereafter. It was kept up for six or eight days. Benefit was apparent within twenty-four hours, and the paralysis had entirely disappeared by the fourth and the nineteenth days. Some of the serum used had been taken three months before from a girl who had had poliomyelitis and had entirely recovered nearly a year before. The other serum had been drawn a month before from a young man who had had infantile paralysis in early childhood. In one of the later cases the first symptoms of the poliomyelitis were noticed the day after the child had been vaccinated, and the family regarded the vaccination as responsible for the poliomyelitis.

The intraspinal technic for this homologous serotherapy is the same as for antimeningitis serum. The total amount injected was 35 c.c. in six injections in one of the last two cases, and 46 c.c. in eight injections in the other. The blood is obtained for the purpose from a in at the elbow; 200 or 250 gm. of blood yields 80 or 100 gm. of serum. The latter is distributed in vials containing 5 or 8 c.c. They are repeatedly tyndallized (intermittent sterilization) for several days and then kept on ice. The meningitic form of poliomyelitis permits the earliest diagnosis, and the limpid cerebrospinal fluid confirms the differentiation. (The fluid may contain cells.) The absence of the knee jerk suggested the true nature of the trouble in some of the cases even before lumbar puncture. In one case the diagnosis was based in part on the knowledge of another case of poliomyelitis in the family, and the serotherapy was instituted in time to ward off all paralysis. Netter's latest communication on the subject was published in the *Bull. et mém. Soc. méd. d. hôp. de Paris*, March 23, 1916, p. 299.

Medicolegal

Laborer Being Overheated and Overworked

(Louisville & N. R. Co. vs. Sawyers (Ky.), 184 S. W. R. 1123)

The Court of Appeals of Kentucky reverses a judgment for $3,000 that was rendered in favor of plaintiff Sawyers, who alleged that he was permanently and painfully injured by becoming too hot and being overworked on a day in July while he was employed as a shoveler and mover of sand in the company's sand pits. The court says that if the case was to be treated as one seeking a recovery because the plaintiff became overheated while engaged in his work, it was clear there could be no recovery under the principles laid down in a comparatively recent cinder pit case, in which it was held that "the master is under no duty to prevent his servant from becoming overheated at his work, resulting from atmospheric or weather conditions, as they are matters entirely beyond his control. In such case, while the servant may not always certainly know how to keep himself within the limits of safety, he is better able to judge than any one else how much heat he can safely stand, how it affects him, and when his endurance reaches a point beyond which he ought not, for his own safety, to continue to work. For these reasons it is for him, and not the master, to determine whether he shall engage in the work at all; or, if so, how energetically, and when he should rest or quit," etc. And if under the allegations the present case could be properly treated as one for damages because the plaintiff was overworked or was required to overtax his physical strength, the same result must be reached. It is a pathetic thing to see a trusted employee, who has faithfully toiled in the service of his employer until he has reached the limit of his physical endurance, cast adrift; but until there has been a revolution in our whole industrial system such things must be. It is an inexorable decree of Nature that wornout things, no matter what may have been their value in the past, shall be cast aside. The only safe and practicaly rule is that each man is the best judge of his own physical strength and powers of endurance; that he knows better than any other can when the limit has been reached, and, when, in following his own instinct of self-preservation, he must desist and exercise his right under the law to give up his work if it is more than he can stand. In either view of this case, the motion for a directed verdict for the defendant should have been sustained.

Disclaimers by Chiropractor of No Avail—Attack on Law Not Sustained

(Teem vs. State (Tex.), 183 S. W. R. 1144)

The Court of Criminal Appeals of Texas, in affirming a conviction of defendant Teem of illegally practicing medicine, says it thinks there can be no sort of doubt but the testimony showed, as charged in the indictment, that he unlawfully practiced medicine, as denounced by law, and no honest jury could have done otherwise than find him guilty. It may be that colleges, from one of which he had a diploma, teach a new science of how to relieve "human beings" of some of the disorders or ills of this life, and effect cures thereof; but, if so, the evidence clearly demonstrated that the practice of it by the defendant, whatever it be named or called, as shown in this case, without a license, and proper record of it, violated both the spirit and the letter of the law. The fact that he studiously abstained from calling his work on patients a "treatment" of them, but instead an "adjustment of a displacement" of them, could have no possible effect to relieve him of the penalties of the law which he violated. No sort of substitution of other words for those used in the statute, or refraining from using them, could change the law. The fact that in his advertisements posted on his home and office and to his patients he stated specifically that he did not profess to do, nor do, the things that the statute denounces, yet, when it was unquestionably shown that he did those very things, could not possibly have the effect to put him without the pale of

the law. His assertions in his advertisements and to his patients that he was not a doctor or surgeon, and that he did not treat disease, etc., was clearly an attempt to evade the law, and should have deceived no one. No other practitioner of any other school of medicine, whether he be called doctor, surgeon or otherwise, or whatever his method or system, treats the disease, etc., as contradistinguished from the patient suffering from the disease, etc. They each and all treat the patient in order to relieve him from the disease and suffering, and thereby assist Nature to heal him, as the defendant was shown to have done the several persons, his patients, who testified herein. Each practitioner may have a different system or method, but the object and purpose of each is to accomplish the same result. The court can see no possible reason, and none was shown in this record, why the defendant should be exempted from procuring and registering his license to practice, when every other practitioner from every other school is required to do so. His school of medicine, or science, or practice, or adjustment, or whatever he may choose to call it, is clearly embraced by the Texas law, as prohibiting him from practicing it on human beings for pay, without first procuring and having a license duly recorded. If he desires to practice his profession, and does so, he should first procure and record his license to do so under the law, as every other practitioner is required to do, and does; and, if he refuses to do this, then he must suffer the penalty of his own acts. Nor does the court find anything to relieve him, in his contention, on a motion for rehearing, that the medical practice act, as it now appears in the revised civil statutes and penal code, was not in fact enacted at the time it purports to be, but that the act, as it first reached the governor's hands, instead, was enacted and became the law, and that, therefore, he was convicted under what purported to be the law, but which in fact and reality was not the law. The court considers that, in any and all events, the law under which the defendant was convicted was in every way valid and legal.

Failure to Diagnose Diphtheria

(Hrubes vs. Faber et al. (Wis.), 157 N. W. R. 519)

The Supreme Court of Wisconsin reverses a judgment rendered in favor of the plaintiff for damages for the death from diphtheria of his daughter a little over 7 years old, the death being alleged to have been caused by unskilful and improper treatment by the defendant. The court says that the child first complained of sickness on Friday afternoon. She was at school in the morning, but at home in the afternoon. The only definite symptom was headache. She did not complain of anything else, and did not complain of sore throat at any time. The defendant saw her on Saturday afternoon, about twenty-four hours after she began to complain. She then complained of headache, and the defendant found a swelling in the back of the throat. There was no redness; the color was like the rest of the throat, only thickened; her general appearance was favorable, and she had no fever. She would not hold still, and the defendant advised her father to bring her to his office the next morning, in order that a more thorough examination might be made. At that time the defendant, assisted by another physician, administered enough chloroform to relax the patient, and the defendant made a careful examination of the swelling and the throat, and found no membrane present, and discovered no other symptoms which caused him to suspect the presence of diphtheria. The other physician, who administered the anesthetic, examined the throat, and outside of a small, circumscribed area on the left side, which he thought looked like an abscess, and which might contain pus or fluid, there was no swelling or any sign of membrane, and no signs or symptoms of any serious condition, outside of what appeared to be an abscess. The condition of the throat did not, in the opinion of such other physician, resemble diphtheria at all. The patient returned to her home, and the defendant did not see her again until Tuesday evening, when he was requested by the father to visit her again, which he did at her home. At that time she walked into the room where he was sitting and he made a slight examination. She had the same swelling, slightly enlarged; there were no local signs to indicate the presence of diphtheria. On Tuesday evening the swelling was more pronounced, and particularly on the outside. At that time the defendant prescribed the use of an ointment which is commonly used in treating mumps, and gave no other treatment. He did not see the child again, and she died without further treatment or examination the next day, Wednesday, at 11 a. m. At the time of her death she was unconscious, in great pain, and was bleeding from her mouth and nose, and catching for breath. After consultation with the health authorities of the city, the defendant signed a death certificate stating the cause of death to be diphtheria. The jury found (1) that the defendant failed to exercise ordinary care in diagnosing or treating the case; (2) that such failure on his part to exercise ordinary care caused the death of the child; (3) that he did not, on Sunday, advise the plaintiff to get a physician other than himself to treat the child; (4) that he did not make known to the plaintiff that he did not want to take cases requiring visits or treatment outside of his office; (5) that the damages resulting from the death were $800. But the court holds that the verdict of the jury to the effect that the failure of the defendant to exercise ordinary care and skill resulted in the death of the child was a mere conjecture, and had no foundation, substantial or otherwise, in the evidence. Verdicts cannot rest in mere conjecture. It followed that the defendant's motion for judgment notwithstanding the verdict should have been granted; and a judgment for the defendant is ordered, dismissing the plaintiff's complaint on the merits. The law does not require impossibilities, or even the exercise of the very highest degree of skill or the utmost care, but only such reasonable care and skill as is usually possessed by physicians of the same school in the locality. The presence of a membrane not being established, there was no evidence in this case on which the jury could base a verdict finding that the defendant did not exercise ordinary care.

Society Proceedings

COMING MEETINGS

Am. Assn. for the Study and Prev. of Inf. Mort., Milwaukee, Oct. 19-21.
American Association of Railway Surgeons, Chicago, Oct. 17-19.
American Public Health Association, Cincinnati, Oct. 24-27.
Clinical Congress of Surgeons, Philadelphia, Oct. 23-28.
Kentucky State Medical Association, Hopkinsville, Oct. 24-27.
Southern Medical Association, Atlanta, Ga., Nov. 13-16.
Virginia State Medical Society, Norfolk, Oct. 24-27.

THE MEDICAL SOCIETY OF THE STATE OF PENNSYLVANIA

Sixty-Sixth Annual Meeting, held at Scranton, Sept. 28-30, 1915

The President, Dr. JOHN B. MCALISTER, in the Chair

Epilepsy as a Medicolegal Problem

DR. N. S. YAWGER, Philadelphia: Medicolegally, the mental manifestations are grouped as: 1. Paroxysms in which the individual is not insane but in which he may be irresponsible; these are (*a*) irresistible impulses or impulsive acts; (*b*) the state of automatism. 2. Paroxysms in which the individual is insane; these may be (*a*) acting under the domination of an insane delusion; (*b*) in a maniacal epileptic outbreak. While these patients often have long intervals of lucidity, they are highly dangerous. This emphasizes the desirability of having the insane detained under the more secure form of committment by court procedure rather than by certificate. It might be desirable that all cases of insanity of considerable duration in which confinement is necessary should be committed similarly.

DISCUSSION

DR. HUGH E. MEREDITH, Danville: If the epileptic is mentally defective and irresponsible, no punishment should follow

a crime committed. Of the approximately 2,000 epileptics in Pennsylvania, many are cared for in insane institutions; and of the number passing under my observation, I have not found one not legally committed in accordance with the lunacy act of 1883. Institutions for the insane are not the places for these patients. I see no reason why the several classes of epilepsy could not be cared for in a properly organized institution in which they may receive special attention and treatment.

Dr. William H. Carmalt, New Haven, Conn.: The state of Connecticut has endeavored to meet legally the care of epileptics by the establishment of a state farm for their care and treatment where, if confirmed epileptics, they may be kept indefinitely. Another method, less satisfactory in its working, is a law prohibiting the marriage of epileptics and the feebleminded and imposing a fine of $50 on any one performing the ceremony. Unfortunately, no one has been fined for making these marriages. The law, however, acts as a moderate deterrent.

Care of the Indigent Insane

Dr. Charles W. Burr, Philadelphia: My object is to arouse physicians to active endeavor in the enforcement of wise legislation in the matter of the care of the indigent insane, and to urge that the solution of this problem lies in the state assuming the entire burden and control of these people. Future work will be to prevent insanity by a real system of eugenics—not the newspaper kind. A certain proportion of the income of the state should by law be appropriated for the care of the insane; there should be a board appointed by the governor, the assembly or both, the members of which should serve terms of given length. To this board should be left entirely the expenditure of funds. It would seem better that each local hospital have its own board of managers, appointed by the central board, and dependent on it for money. The medical member of the central board should decide in doubtful cases whether or not any given patient needs longer hospital care. The board controlling the insane, feebleminded and epileptics should be entirely separate from the board of charities. Acute and chronic insanity should be treated in separate institutions. The hospitals for the acutely ill should have a corps of research workers in the real meaning of the phrase. The chronic insane should not be herded in great institutions, doing, seeing, hearing nothing; the institutions should be small, in the country—real farms. While it is manifest that the state cannot undertake at once the entire care of the indigent insane, it can and ought to adopt such state care as a permanent policy, and then gradually evolve the whole question.

DISCUSSION

Dr. Charles H. Frazier, Philadelphia: About three years ago the Public Charities Association, which has for its object the adoption of more efficient methods of caring for the state's dependent people, made a survey of all the institutions in this state caring for the insane. This survey shows that in many instances our county institutions were merely adjuncts to almshouses, improperly manned as to medical officers and attendants, without proper facilities for the treatment of the insane, giving, in fact, merely custodial care rather than medical treatment. To say that it is cheaper to care for the insane in county hospitals is a discreditable argument for the state to use against the care of this unfortunate class. To carry out the plan suggested by Dr. Burr, this society should, through its Committee on Public Policy and through its Subcommittee for the Promotion of More Efficient Laws for the Insane, be prepared to introduce certain remedial measures at the next meeting of our legislature; and, that the county medical societies should appoint committees, the members of which shall familiarize themselves with the conditions prevailing in their county asylums or almshouses that they may from first-hand knowledge advise those representing them in the senate and house.

Dr. Owen Copp, Philadelphia: Adequacy in medical examination and treatment is the first and indispensable requirement of any system of provision for these people. Experience teaches that the state alone can reasonably be expected to provide sufficiently for medical treatment and scientific study of these classes. The so-called economy of local and county care is delusive in that it is a saving by deprivation of sufficient medical attention, facilities for treatment, precautions against secondary infections and reproduction of defectives. The development of the colony idea in the care of the insane will eventually completely surpass the claims made by the advocate of county asylums. The problem is medical and will find solution only through the action of the medical profession. Its neglect is a menace to mental health and racial soundness.

Dr. John A. Lichty, Pittsburgh: Apparently little is to be hoped for from the standpoint of cure. We must, therefore, prevent the condition so far as possible through a study of its cause. We need a state organization for the care of the insane which will allow us to inquire concerning conditions and enable us to correct that which is detrimental in the life of the patient.

The Workmen's Compensation Law

Dr. William L. Estes, South Bethlehem: At the request of the board of trustees that its chairman present suggestions for amendments, and after consideration of suggestions received from the various county societies, the following amendments are proposed: 1. Define major operation as used in the wording of the act. 2. Extend the period of direct payment for treating the injured workman to thirty days. 3. Increase the limit of payment for "reasonable surgical, medical and hospital services," etc. The matter of proper fees in return for treatment of injured employees is apparently the crux of the whole difficulty. The only efficient remedy in the present business error seems to be thorough organization through the county medical societies in demanding from insurance companies the same rate of remuneration each physician is entitled to and is accustomed to receive for similar services from members of the community in which he lives. If the tendency of the law is to reduce the remuneration of physicians, it is necessary and proper to amend it. The medical profession has a right to be consulted in the drafting of these laws.

Internal Secretions and Their Relation to Nervous Disorders

Dr. Seymour DeWitt Ludlum, Philadelphia: Studying nervous cases by their physiologic symptoms points toward etiologic factors which, taken in consideration with the morphology of the patient and with Abderhalden's reactions done on the blood serum for internal secretions, give quite definite conceptions of backwardness, some forms of insanity, neurasthenia, dystrophies, etc.

Fecal Incontinence

Dr. Samuel Goodwin Gant, New York: The loss of sphincter control is in the majority of cases due to improper treatment of anorectal wounds. The condition will become rare when surgeons learn to treat fistula-in-ano properly and cease divulsing the sphincter rapidly with the finger and mechanical dilators and decline to perform Whitehead's operation for hemorrhoids. The cause of fecal incontinence may be nonoperative (brain and cord diseases, ulcerative proctitis, rectal cancer, injuries to the sphincters, etc.) and surgical. Loss of sphincter control is due to imperfect drainage, permitting skin or mucosa to grow into cut, useless probing, cauterization of wound, etc. Division of the internal with the external sphincter does not materially increase the danger of incontinence, but severing the nerves controlling the sphincter does. Nonoperative treatment is unsatisfactory, but usually surgical treatment brings relief.

DISCUSSION

Dr. Ira G. Shoemaker, Reading: I have seen pitiable cases, the result of lack of care and good judgment in operations for fistula. In cases in which both sphincters are involved, the best results are obtained in the use of the elastic ligature. I have used it successfully many times. An irritation is produced as the ligature cuts through the tissues which forms a good base and promotes healing.

Cooperation of Physician and Surgeon in After-Treatment of Patients Operated on for Diseases of Gastro-Intestinal Tract

DRS. EDWARD H. GOODMAN and JOHN SPEESE, Philadelphia: Cooperation of physician and surgeon should begin immediately after operation during the stay in the hospital. Even greater cooperation should follow in cases in which the physician is consulted in a case surgical from the beginning, but in which he drops out after examination and the surgeon again assumes entire charge. Such a practice is unfair to the patient, increases the burden of the surgeon, and ignores certain potentialities of the internist valuable to patient and surgeon. If from the hospital the patient returns to a physician not familiar with his idiosyncrasies, the hospital physician should fully inform the medical attendant of all important facts relative to the patient. It is unfair to the patient to discharge him from the surgical ward, believing him cured, and neglect to instruct him as to his mode of living during the ensuing six to twelve months or longer. Comparatively few patients are immediately relieved by operation. Each patient, though believing himself to be in perfect health, should report to his physician at regular intervals.

DISCUSSION

DR. JOHN A. LICHTY, Pittsburgh: This cooperation should be operative and preoperative as well. There is opportunity for meddling on the part of the internist, and there are surgeon's who are dogmatic to an unpleasant degree. Reasonable men, however, will get together, and as consequence have satisfactory results in these very difficult cases.

Clinical Interpretation of the Wassermann Test

DRS. JOHN A. LICHTY, Pittsburgh, and JAMES H. WHITECRAFT, Wilkinsburg: The Wassermann test, while not absolutely certain, is the most valuable laboratory aid in the diagnosis of syphilis. A negative test in suspected cases should be repeated before the suspicion is dropped, often after a provocative dose of salvarsan. A negative reaction may be due to previous treatment, which has not been curative. The influence of specific treatment on clinical manifestations of syphilis tends to show the reliability of the Wassermann test. The existence of a positive Wassermann should not be construed to mean that syphilis is the only condition present which requires treatment.

Modern Diagnosis and Results Clinically, Serologically and Sociologically of Syphilis, Treated with Salvarsan and Its Substitutes

DR. B. A. THOMAS, Philadelphia: The treatment of syphilis remains empiric. The ultimate proof of cure rests rather on complete freedom of symptoms for a generation or more. The Wassermann reaction furnishes the best control of treatment, and is the most reliable index of cure subsequent to proper treatment. The sheet anchor in the treatment of syphilis is salvarsan, neosalvarsan or one of their substitutes. It is of paramount importance, however, that the injections of arsenobenzol, in the beginning, be administered as early as possible and intensively in full doses commensurate with the physiologic tolerance of the patient. Serologically, judged on a three months' to a five year duration, syphilis in the chancre stage, if diagnosed early, may be cured by two injections of salvarsan or neosalvarsan; if diagnosis be made before the advent of a positive Wassermann, one dose of either of these drugs may be sufficient. Secondary syphilis seems to do just as well without as with mercury, provided enough salvarsan or neosalvarsan is given to produce a negative Wassermann. The serologic results in tertiary syphilis treated intensively with salvarsan and its substitutes are not so brilliant as those of the secondary period. The best substitute for salvarsan and neosalvarsan is our American arsenobenzol. The French preparation of arsenobenzol and the Canadian diarsenol may be just as efficient as salvarsan and neosalvarsan, but because of their greater tendency to toxic phenomena are not destined to supersede the German products. The arylarsonate soamin and sodium cacodylate, both clinically and serologically, have no place in the effective treatment of syphilis.

Treatment of Syphilis by Salvarsan Controlled by the Wassermann Reaction

DR. JOHN D. WILSON, Scranton: My experience with these cases has led me to believe that salvarsan is most useful during the early active period of the disease and that, small, frequently repeated doses, namely, salvarsan, from 0.3 to 0.4 gm. every week or ten days for twelve injections, and in conjunction with active mercurial treatment, should constitute the first course of treatment in any new active case. The after-treatment is to be determined by the return of suspicious symptoms and by the Wassermann reaction on the blood and spinal fluid.

DISCUSSION

DR. GEORGE MORRIS PIERSOL, Philadelphia: The successful treatment of syphilis depends on its early recognition and prompt management. The secretion of all doubtful venereal sores and early mucosal lesions should be examined for the *Spirochaeta pallida*, in both of which lesions it is abundant. If the spirochetes cannot be found, a definite prognosis should not be given until repeated examinations have been made and the Wassermann reaction thoroughly tried out. The time of the appearance of the Wassermann is subject to wide individual variations. The Wassermann reaction is not a primary but a secondary aid to diagnosis. In many of the more obscure visceral lesions of the nervous system, cardiovascular apparatus and in latent hereditary syphilis, very definite clinical manifestations may be present, and yet the blood Wassermann reaction negative. Conversely, while a positive blood Wassermann reaction means that a syphilitic infection is present, it far from proves that the trouble of which the patient complains is due to this infection. No apparently cured case of secondary syphilis should be discharged until spinal puncture has demonstrated that involvement of the nervous system is absent. The present equipment of the majority of our state and hospital dispensaries for the care of syphilitic cases is totally inadequate for the thorough treatment of active syphilitics. Attention should be directed to the desirability of performing the gold sol test, or Lange colloidal gold test on all spinal fluids in addition to the Wassermann, cell count and globulin tests. In primary infections it is possible to abort the condition by the intensive use of salvarsan alone; but such treatment must be adequate. The criteria of a cure depend on a repeatedly negative Wassermann reaction for at least two years after a provocative injection of salvarsan, and a normal spinal fluid.

DR. JOHN A. KOLMER, Philadelphia: Experiments and clinical data indicate the superior spirocheticidal activity of salvarsan and arsenobenzol over neosalvarsan. Sodium cacodylate was found absolutely without effect in experimental trypanosomiasis, and this drug should not be relied on to destroy *Spirochaeta pallida*. In an experimental study of the toxicity of various mercurials, we find that insoluble salts of mercury, as the salicylates, are very slowly absorbed from the subcutaneous and muscular tissues. Physicians should therefore avoid administering such preparations at very close intervals in order to avoid cumulative effects, particularly expressed in renal irritation as shown by the presence of albumin and casts in the urine. My colleague, Dr. Schamberg, always continues treatment until the Wassermann reaction is negative with cholesterinized antigens. This result can be obtained only after the administration of a large number of doses of salvarsan. I believe it a serious error to discontinue treatment on the basis of a negative test with an antigen of alcoholic syphilitic liver, because experience has taught me that a number of these persons are still Wassermann positive and can be rendered Wassermann negative with additional treatment. I have used the Hecht-Gradwohl reaction as a control on the Wassermann and find that it yields about 12 per cent. more true positive reactions than the Wassermann. I have confirmed the observations of Sherrick that normal persons taking potassium iodid may yield positive syphilitic reactions. The influence of the iodids should, therefore, be carefully ruled out before conducting this test.

(To be continued)

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Diseases of Children, Chicago

October, XII, No. 4

1 Protein Metabolism of Infant. F. B. Talbot and J. L. Gamble, Boston.—p. 333.
2 *Bacteriology of Urine in Healthy Children and Those Suffering from Extra-Urinary Infections. C. Beeler and H. F. Helmholz, Boston.—p. 345.
3 *Frequency of Hereditary Syphilis. F. S. Churchill and R. S. Austin, Chicago.—p. 355.
4 Clinical Course and Physical Signs in Hereditary Syphilis of Early Age. A. Post, Boston.—p. 364.
5 Clinical Signs and Diagnosis of Late Hereditary Syphilis. P. C. Jeans, St. Louis.—p. 374.
6 *Comparative Study of Luetin and Wassermann Reactions in Infancy and Childhood. L. R. DeBuys and J. A. Lanford, New Orleans.—p. 387.
7 *Treatment of Hereditary Syphilis. P. H. Sylvester, Boston.—p. 395.
8 Review of Literature of Syphilis in Infancy and Childhood. H. P. Towle, Boston.—p. 406.

2. **Urine Bacteriology.**—In 118 specimens of carefully catheterized urine from sixty-one different girls, examined by Beeler and Helmholz, sixty-one were sterile and fifty-seven contained bacteria. Of those from normal infants, thirteen were sterile and eleven contained bacteria. Of those from extra-urinary infections in patients under *2* years of age, none were sterile and twenty-four contained organisms. In those from girls over *2* years, thirty-eight were sterile and twenty-two contained bacteria. The number of bacteria found in Series 1 was considerably larger than in Series *2*. This may be explained by the fact that in the older children one can cleanse the urethral orifice much easier than in the infant and introduce the catheter directly into the urethra. The bacterial flora was practically the same in both series, gram-positive cocci and diphtheroid organism predominating, the former being present in practically every case in which any organisms were found. In no instance were gram-negative bacilli found in such numbers in both specimens that it seemed probable that it was more than an accidental contamination from the urethra.

3. **Frequency of Hereditary Syphilis.**—Intensive study by Churchill and Austin of a group of 695 patients in the Children's Memorial Hospital, during the winter of 1915-1916, the study embracing both clinical and laboratory methods of investigation, shows an incidence of *3.3* per cent. of hereditary syphilis. The amount of hereditary syphilis among the hospital infants and children in New York, St. Louis, San Francisco and Chicago ranges from *2* to 6 per cent.

6. **Tests for Syphilis.**—According to DeBuys and Lanford the Wassermann reaction is not so valuable as the luetin test in cases of hereditary syphilis. Their series shows that it is impossible for a mother to give birth to a child who gives positive laboratory tests for congenital syphilis without herself giving positive tests. While the authors believe that the luetin test is of more value in being more often positive than the Wassermann, they do not believe that it should displace the Wassermann, as both tests, it would seem, serve distinct purposes, the Wassermann to give evidence of the presence of antibodies in the circulation, indicating an active process; while the luetin not only gives this evidence, but also indicates an existing syphilitic condition, even though it be inactive. The luetin test is not without its disadvantages, as it requires considerable experience in differentiating the lesion from the simple reaction produced by the intradermal injection of sterile inert foreign material. It is also influenced by the administration of certain drugs, which may give rise to a pseudoreaction, thereby adding to the possible inaccuracy in the interpretation of its reading. Therefore, luetin reactions should not be considered negative until sufficient time shall have elapsed to warrant such a reading.

7. **Treatment of Hereditary Syphilis.**—Sylvester advises that fetal syphilis should be treated by treating the pregnant syphilitic mother vigorously. The balance of evidence shows that the child is much benefited thereby. Arsenic should be used in fairly large doses if immediate intense action is desired. Mercury in one form or another should be used in conjunction with arsenic and continued a long time after all evidence of the disease has disappeared. Treatment should be persisted in for at least two years, after which a negative Wassermann, after six months without treatment, may be considered evidence of a cure. Neosalvarsan appears to be the most favored arsenical. Lesions other than of the central nervous system may be readily relieved. Latent cases should be treated.

American Journal of Public Health, Boston

September, VI, No. 9

9 Sixty Years of Providence Health Department. C. V. Chapin, Providence, R. I.—p. 905.
10 Relative Values in Public Health Work. F. Schneider, Jr., New York.—p. 916.
11 Harm Done in Ascribing All Babies' Sore Eyes to Gonorrhea. C. C. Van Blarcom, New York.—p. 926.
12 Period of Life at Which Infection from Tuberculosis Occurs Most Frequently. S. A. Knopf, New York.—p. 934.
13 Efficiency of Venereal Clinics. P. S. Platt, New York.—p. 953.
14 Industrial Hygiene and Health Insurance. J. B. Andrews.—p. 959.
15 Registration of Non-Resident Deaths. W. H. Davis, Boston.—p. 964.
16 Census of Contagious Diseases of 8,786 Children. E. C. Henderson, London.—p. 971.
17 Relation of Hospital and Dispensary to Occupational Diseases. W. G. Thompson, New York.—p. 982.
18 Handling of Shucked Oysters. C. Bates, Washington, D. C.—p. 987.
19 Suggestions for Test to Measure Drainability of Emscher Tank Sludge. W. L. Stevenson, Philadelphia.—p. 991.
20 Providence City Hospital. D. L. Richardson, Providence, R. I.—p. 995.

American Journal of Roentgenology, New York

September, III, No. 9

21 Roentgenoscopy of Respiratory Organs. A. W. Crane, Kalamazoo, Mich.—p. 419.
22 Congenital Anomalies and Variations of Bony Skeleton as Revealed by Roentgen Ray. A. Hartung, Chicago.—p. 430.
23 Idiopathic Infantile Osteopsathyrosis. E. S. Blaine, Chicago.—p. 438.
24 Roentgenographic Diagnosis of Renal Calculus. J. Friedmann, New York.—p. 443.

Arkansas Medical Society Journal, Little Rock

September, XIII, No. 4

25 Erotomania. T. Douglass, Ozark.—p. 67.
26 Healthy Citizen. J. T. Clegg, Siloam Springs.—p. 77.

Boston Medical and Surgical Journal

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27 Importance of Early Reduction of Fractures with Displacement. W. Darrach, New York—p. 437.
28 Treatment of Hip Fractures. F. J. Cotton, Boston.—p. 438.
29 Operative Treatment of Fracture of Patella. C. L. Scudder and R. H. Miller, Boston.—p. 441.
30 Some Aspects of Treatment of Compound Fractures Under Civil and Military Conditions. D. Cheever, Boston.—p. 442.
31 Flexed Spica and Wheel Chair in Treatment of Fracture of Neck of Femur. G. A. Moore, Brockton.—p. 448.

Canadian Medical Association Journal, Toronto

September, VI, No. 9

32 Epidemic of Pneumococcus Infection. T. McCrae, Philadelphia.—p. 769.
33 Experiences in Surgery of Present War. E. A. Archibald.—p. 775.
34 Irritable Heart of Soldiers (Soldier's Heart). R. D. Rudolf, Toronto.—p. 796.
35 Field Ambulance and Its Organization. W. L. Watt.—p. 811.
36 Treatment of Diphtheria at Alexandra Hospital, Montreal. H. B. Cushing and E. V. Murphy, Montreal.—p. 817.

Cleveland Medical Journal

August, XV, No. 8

37 Fecal Fistulae. G. W. Crile, Cleveland.—p. 507.
38 Etiology and Symptomology of Acute Poliomyelitis. H. C. King, Cleveland.—p. 510.
39 Recent Advances in Gynecology and Obstetrics. W. D. Fullerton, Cleveland.—p. 514.
40 Neurologic Reviews. T. S. Keyser, Cleveland.—p. 516.
41 Progress of Medicine. H. Feil, Cleveland.—p. 521.
42 Recent Advances in Pediatrics. H. C. King, Cleveland.—p. 523.

Florida Medical Association Journal, Jacksonville

September, III, No. 3

43 Fracture of Neck of Femur. J. Reeve, DeLand.—p. 65.
44 Fractures at Elbow. R. A. Ely, Tampa.—p. 69.

45 Study of One Hundred and Eighty-Four Blood Examinations from Standpoint of Malarial Index in Acute Febrile Conditions. J. S. Turberville, Century.—p. 71.
46 Some of Symptoms of Pancreatitis. M. G. Chancey, Tampa.—p. 73.
47 Apendicitis Complicating Pregnancy. C. L. Jennings, Jacksonville. —p. 82.
48 Report of Urologic Cases. E. P. Merritt, Atlanta.—p. 86.

Journal of Experimental Medicine, Baltimore

October, XXIV, No. 4

49 Formation of Methemoglobin by Streptococcus Viridans. F. G. Blake, Boston.—p. 315.
50 *Further Study of Gastric Ulcers Following Adrenalectomy. F. C. Mann, Rochester, Minn.—p. 329.
51 *Agglutination of Treponema Pallidum in Human Syphilis. J. A. Kolmer, S. Broadwell, Jr., and T. Matsunami, Philadelphia.—p. 333.
52 Study of Physiologic Activity of Adenomata of Thyroid in Relation to Their Iodin Content. A. Graham, Cleveland.—p. 343.
53 *Spontaneous Diabetes in Dog. E. B. Krumbhaar, Philadelphia.—p. 361.
54 Technic of Cultivating Human Tissues in Vitro. R. A. Lambert, New York.—p. 367.
55 *Study of Serum Salvarsanized in Vitro. H. F. Swift, New York. —p. 373.
56 Latent Period in Growth of Bacteria. A. M. Chesney, New York. —p. 387.
57 *Rapid Method for Diagnosis of Renal Tuberculosis by Use of Roentgenized Guinea-Pig. J. J. Morton, Boston.—p. 419.

50. **Gastric Ulcers Following Adrenalectomy.**—In order to determine whether the acid medium was the important factor in the production of acute stomach ulcers, a loop of the first part of the jejunum, varying in length from 6 to 12 cm., was functionally resected under anesthesia and implanted in the posterior wall of the stomach in the region of the antrum pylori. The continuity of the intestine was maintained by an intestinal anastomosis. The dogs quickly recovered from the operation and maintained excellent health for many months. Animals killed at various periods after operation demonstrated that the transplanted mucosa underwent definite changes, but ulcers did not develop except in one instance in which an ulcer was found around a retained silk suture. In four of these animals after a considerable length of time had elapsed, the right suprarenal was removed, and a few months later the left gland was extirpated. All developed the typical symptoms of suprarenal insufficiency and died at various times after the removal of the last gland. In all these animals definite lesions of the gastric mucosa were found at necropsy. In three there were ulcerations, while in one the mucosa was injected only and showed areas of erosion. In three the jejunal transplant appeared exactly similar to the control. In one there appeared to be a slight loss of jejunal mucosa in pin-point areas, which microscopically proved to be small ulcers.

51. **Agglutination of Treponema Pallidum.**—The authors believe that with a suitable culture or cultures well marked agglutination of *Treponema pallidum* in dilutions of 1:5, or better 1:10 and higher, indicates pallida infection and may prove of value in the diagnosis of isolated cases, particularly in the later stages.

53. **Spontaneous Diabetes in Dog.**—The clinical picture in the case of this dog was one of a true diabetes mellitus, first attracting attention after miscarriage. Although the G:N ratio sank from 3:1 on 10 gm. of nitrogen to 1.7:1 after three days' fasting, the disease progressed steadily in spite of a long continued carbohydrate-free diet. Together with the usual complications of diabetes, a malignant tumor of the thymus developed, so that after five months' observations a slow death was forestalled by chloroform. The most striking feature at necropsy was the large, apparently normal pancreas, which exhibited histologically marked changes in the islands of Langerhans, extreme hydropic degeneration and exhaustion of granules, involving both alpha and beta cells, but especially the latter, and replacement of some islands by fibrous tissue.

55. **Serum Salvarsanized in Vitro.**—Swift summarizes his study as follows: addition of salvarsan to serum in vitro produces a spirocheticidal mixture which is increased in potency by heating. The heated serum of salvarsan treated patients is more spirocheticidal if it has been in contact with the clot over night than if it has been separated immediately after coagulation. This is not true with the serum from blood which has been salvarsanized in vitro. The addition of salvarsan directly to serum produces a more potent mixture than results from the serum from blood to which salvarsan has been added in equivalent amounts. The increase in activity of salvarsanized serum produced by heating to 56 C. is due in part to the removal of inhibitory substances in the serum and in part to a direct increase in spirocheticidal power in the heated salvarsan. Both salvarsanized and neosalvarsanized serum are rendered more spirocheticidal by heating. A more active spirocheticidal mixture is produced by mixing small amounts of salvarsan with the serum of a salvarsan treated patient than with normal serum.

57. **Diagnosis of Renal Tuberculosis.**—Morton says it is possible to reduce the resistance of guinea-pigs to tuberculosis by Roentgen exposures, so that when animal inoculation is required for a diagnosis a much quicker result may be had than by the use of normal animals. In renal tuberculosis when it is necessary to resort to the use of animals it ordinarily requires from five to seven weeks, while by the use of roentgenized guinea-pigs the diagnosis can be made in from eight to ten days. The resistance can be sufficiently lowered by one massive dose of Roentgen ray administered either shortly before or after the inoculation of the material to be tested. The lesions are so marked in these animals that the diagnosis is certain after the interval indicated above.

Journal of Infectious Diseases, Chicago

October, XIX, No. 4

58 *Etiology of Cholecystitis and Gallstones and Their Production by Intravenous Injection of Bacteria. E. C. Rosenow, Rochester, Minn.—p. 527.
59 Modification of Römer's Intracutaneous Method for Demonstration of Small Amounts of Diphtheria Antitoxin in Blood Serum. A. Zingher, New York.—p. 557.
60 Diphtheria Bacilli in Microscopic Sections of Tissues from Diphtheria Carriers. M. W. Brown, Chicago.—p. 562.
61 Attenuation of Hog-Cholera Virus. D. J. Healy and E. J. Coyle, Lexington, Ky.—p. 569.
62 *Specificity of Streptococci. A. T. Henrici, Minneapolis.—p. 572.
63 Correlation of Certain Reactions of Colon Bacilli and Lose Organisms with Source. F. Hulton, Philadelphia.—p. 606.
64 *Fate of Mammalian Tuberculosis Bacillus in Sterilized and Cheeses. L. Van Es and A. F. Schalk, Agricultural College, N. D. —p. 614.
65 Experimental Epidemiology in Tuberculosis. A. Dukes, Llandrindod Wells.—p. 628.
66 Immune Reactions in Scarlet Fever. Antigenic Properties of Bacteria Found in Scarlatina. G. F. Dick and G. H. Dick, Chicago.—p. 638.
67 Presence of Soil and Fecal Strains of Organisms of Colon Aerogenes Group in Waters of Kansas. M. Greenfield, Lawrence, Kan.—p. 647.
68 Milking Machine Source of Bacterial Contamination of Milk. G. F. Ruediger, La Salle.—p. 652.

58. **Etiology of Cholecystitis and Gallstones.**—Rosenow records the results of cultures by special methods from the liquid contents of the gallbladder, from the centers of gallstones, from the wall of the gallbladder, and from the adjoining lymph glands removed at operation, in a series of cases of cholecystitis, and the results of animal experiments with the bacteria thus isolated. These results, it is believed, throw definite light on the mechanism of the occurrence of cholecystitis and gallstones. The cultures were made from material removed at operation in 47 cases. The bile or other fluid content of the gallbladder was cultured in 29 cases, 13 of which showed no bacteria. In the remaining 16 cases the streptococcus was not found in pure culture, being found in conjunction with the colon bacillus in 5 instances, and with other bacteria in 2. The colon bacillus was found in pure culture 4 times. Cultures from the nuclei of the common types of gallstones were made in 33 cases, showing no bacteria. In the remaining 29 cases the streptococcus was isolated in pure culture in 17, and the colon bacillus in pure growth in 1. The streptococcus occurred with the colon bacillus in 3 cases, and with other bacteria in 4. Cultures made from 4 typical cholesterin stones showed no streptococci; 2 were sterile, 1 yielded a few colonies of a diphtheroid bacillus, and 1 the colon bacillus. Cultures from the wall of the gallbladder were made in 32 cases, 5 of which were sterile. Of the remaining 27 the streptococcus was found in pure culture

in 10, the colon bacillus in 1, mixtures of streptococcus and colon bacillus in 8, and the streptococcus with other bacteria in 3. Of the cases in which the fluid contents were sterile the streptococcus was isolated from the wall of the gall-bladder in 8, and from the center of gallstones in 6. The adjacent lymph glands were cultured in 8 cases; 1 gave no bacteria, 4 showed pure cultures of the streptococcus, 1 the streptococcus and a diphtheroid bacillus, and 1 a pure culture of colon bacillus. *Bacillus welchii, Staphylococcus aureus,* diphtheroid bacilli, fusiform bacilli, *Bacillus mucosus* and the typhoid bacillus were found occasionally.

62. **Specificity of Streptococci.**—Fifty-three strains of streptococci from various sources were inoculated by Henrici into 225 rabbits, and the virulence and elective organ affinities were compared with the powers of hemolysis and carbohydrate fermentation. The carbohydrate fermentation tests are of no significance from the standpoint of virulence, and of slight or doubtful significance from the standpoint of tissue localization. The hemolytic streptococci are more virulent than the nonhemolytic, but the two classes localize in the same tissues with equal frequency. Henrici does not believe that we are not justified, from evidence obtained by rabbit inoculation experiments, in recognizing any particular class of streptococci as specific for rheumatic fever, since the various rheumatic lesions, arthritis, myocarditis, endocarditis, and myositis, may be produced by some strains in each of the varieties, and are produced in equal proportion by both hemolytic and nonhemolytic strepococci. Streptococci of various kinds may produce in rabbits types of myocarditis which cannot be differentiated from the Aschoff-Geipel nodules generally considered diagnostic of rheumatism. Experimental streptococcal endocarditis usually develops by implantation rather than by embolism.

64. **Fate of Mammalian Tubercle Bacilli in Birds.**—It was found by Van Es and Schalk that a considerable number of birds into which mammalian tubercle bacilli are introduced, either by ingestion or by inoculation, die in a highly emaciated state. As a result of the incorporation of such bacilli into the bodies of birds, the latter may retain the organisms for long periods with their pathogenic characteristics fully preserved. In consequence it is well within the range of possibility that birds may serve as intermediary carriers and transmitters of mammalian tuberculosis.

Journal of Laboratory and Clinical Medicine, St. Louis

September, I, No. 12

69 Fibrinous Proteins. V. C. Vaughan, Ann Arbor, Mich.—p. 851. To be continued.

70 *Peripheral Action of Opium Alkaloids with Special Reference to Bladder. D. E. Jackson, St. Louis.—p. 862.

71 *Antidotes in Mercuric Chlorid Poisoning—Experimental Study. R. Fantus, Chicago.—p. 879.

72 Bence-Jones Protein. W. A. Groat and R. K. Brewer, Syracuse, N. Y.—p. 895.

73 Detection of Small Amounts of Blood. T. H. Kelly, Cincinnati. —p. 897.

74 Temperature Reactions in Anaphylaxis. M. I. Smith, Ann Arbor, Mich.—p. 902.

75 Behavior of Certain Nitrogenous Metabolites in Blood in Nephritis. H. T. Karsner, Cleveland.—p. 910.

76 New Container for Pathologic Specimens. C. Kellner, New Haven, Conn.—p. 917.

77 Simple Method of Concentrating Tubercle Bacilli in Sputum and Urine. W. Krauss and J. S. Fleming, Memphis, Tenn.—p. 919.

70. **Peripheral Action of Opium Alkaloids.**—The experiments described by Jackson prove that those opium alkaloids which belong to the phenanthrene series, that is, morphin, codein, thebain, heroin, dionin, etc., in large intravenous doses cause in dogs a profound contraction of the bladder. A similar contraction of the bronchioles is produced by these drugs. Jackson failed in a few experiments to obtain this contraction with some other ones of these alkaloids, notably papaverin, cryptopin and cotarnin. Apparently the contractions of the bladder and of the bronchioles produced by these drugs are strictly analogous and in all probability of identical origin. The contractions in both organs occur simultaneously, are usually of approximately the same proportions, last for corresponding periods of time, and when the initial contraction is maximal then later injections of any sized doses of either the initial drug or of any other of the series will not produce any further contraction whatever of either bladder or bronchioles. These reactions closely resemble those produced by drugs which first simulate and secondarily paralyze nervous structures, such, for example, as the action of lobelin on ganglia. But so far as Jackson has been able to determine by pharmacologic means no paralysis of either nervous or muscular structures is produced by these alkaloids.

71. **Antidotes in Mercuric Chlorid Poisoning.**—Fantus says that egg albumin is of little value as an antidote to mercuric chlorid, unless it is given immediately after the poison is swallowed. Milk and serum albumin are worthless. Hall's solution (potassium iodid and quinin), is useless as an antidote. Sodium bicarbonate and sodium acetate possibly have a moderate antidotal value. Sodium carbonate is of no value. Potassium bitartrate and sodium sulphate have no antidotal value. Stannous chlorid has little antidotal value. Calcium sulphite is probably too toxic to be of use as an antidote. Sodium phosphite alone has no antidotal value; but mixed in a certain proportion with sodium acetate it has antidotal efficiency. Sodium hypophosphite mixed with a certain proportion of sodium acetate or of hydrogen peroxid is also highly efficaceous as an antidote. As the result of his studies, Fantus recommends the following antidotal treatment for mercuric chlorid poisoning: immediate administration of a tablet composed of sodium phosphite, 0.36 gm., and sodium acetate, 0.24 gm. If this be not available, give the following: sodium hypophosphite, 1.00 gm.; water, 10.00 mils and hydrogen peroxid, 5.00 mils. If the amount of the poison taken be known, ten times as much of the hypophosphite should be given as poison was taken. As this might require a large and possibly harmful amount of hypophosphite, it should immediately be followed by copious lavage, with a very dilute solution of the antidote. This may be followed by a safe dose of the antidote, which is to be retained, and which might be repeated every eight hours for several days. This antidotal treatment might be combined with some such eliminant treatment.

77. **Method of Concentrating Tubercle Bacilli in Sputum and Urine.**—For sputum: place 5 c.c. sputum in a 15 c.c. centrifuge tube, add 5 c.c. of a 10 per cent. sodium chlorid solution and shake in a shaking machine, or by hand if none available, until it is a thin homogenous fluid as free from clumps as possible. Add 0.5 c.c. of gasoline and repeat shaking process until the gasoline is thoroughly emulsified. Centrifuge at a low rate of speed until the gasoline forms a supernatant liquid immediately beneath which is a scummy layer in which tubercle bacilli will be found, if present in original specimen. For urine: place 10 c.c. urine in 15 c.c. centrifuge tube and centrifuge three minutes at a rapid rate of speed. Pour off supernatant fluid. To the sediment add 10 c.c. of original urine and 1 gm. of sodium chlorid. Shake thoroughly or until the sodium chlorid is dissolved, and add 0.5 c.c. of gasoline. Shake again for about five minutes, then centrifuge slowly. The scum beneath the gasoline contains tubercle bacilli, if present.

Journal of Medical Research, Boston

September, XXXV, No. 1

78 *Studies in Immunity to Tuberculosis. Cutaneous Reaction to Tuberculo-Protein. A. K. Krause, Saranac Lake, N. Y.—p. 1.

79 *Id. Anaphylactic State in Its Relation to Resistance to Tuberculous Infection and Tuberculous Disease. A. K. Krause, Saranac Lake, N. Y.—p. 25.

80 *Id. General Tuberculin Reaction. A. K. Krause, Saranac Lake, N. Y.—p. 43.

81 Endamœba Buccalis in Mouths of Institutional Children. O. W. H. Mitchell, W. L. Culpepper and W. D. Ayer, Syracuse, N. Y. —p. 51.

82 Studies on Paratyphoid Enteritidis Group. Reaction in Litmus Milk as Method of Biologic Differentiation. C. Krumwiede, Jr., J. S. Pratt and L. A. Kohn, New York.—p. 55.

83 *Action of Benzol. Deuterophase of Diphasic Leukopenia and Antigen Antibody Reaction. H. G. Weiskotten, S. C. Schwartz and H. S. Steensland, Syracuse, N. Y.—p. 63.

84 *Id. Urinary Phenols with Special Reference to Diphasic Leukopenia. R. K. Brewer and H. G. Weiskotten, Syracuse, N. Y. —p. 71.

85 Lipase Studies. Regional Lipolytic Activity in Normal Human Brain. C. Quinan.—p. 79.

86 *Studies on Circulation. Effect of Disease on Renal Arterial Bed. Capacity of Coronary Arteries as Related to Weight and Age of Heart. A. A. Ghoreyeb, Boston.—p. 87.
87 Use of Mallory's Connective Tissue Stain as Indicator of Character of Thyroid Colloid. A. L. Tatum, Philadelphia.—p. 95.
88 *Fluid Enrichment Medium for Isolation of Typhoid Bacilli from Stools. O. Teague and A. W. Clurman, Rosebank, N. Y.—p. 107.
89 Lipoma Myxomatodes. Review of Literature; Report of Case. H. E. Robertson, Minneapolis.—p. 131.
90 *Etiology of Rocky Mountain Spotted Fever. Occurrence of Parasite in Tick. S. B. Wolbach, Boston.—p. 147.

78. **Cutaneous Reaction to Tuberculo-Protein.**—Krause claims that cutaneous hypersensitiveness to tuberculoprotein is inaugurated by the establishment of infection and the development of the initial focus. It increases with progressive disease. It varies directly with the extent and intensity of the disease. It diminishes with the healing of the disease. It is probably never entirely lost (except in the presence of intercurrent disease, pregnancy, etc.). It is increased by reinfection. It is diminished or completely wiped out during the period of the general tuberculin reaction. It is suggested by the author that tissue hypersensitiveness may be a function of immunity to reinfection.

79. **Anaphylactic State in Its Relation to Resistance to Tuberculous Infection and Tuberculous Disease.**—The experiments outlined by Krause were concerned with the influence on resistance of a single, marked, anaphylactic intoxication. He concludes that anaphylactic shock, experienced by guinea-pigs a short time before infection with tubercle bacilli of low virulence, did not reduce their resistance to such an extent that the parasitism of the particular micro-organism concerned was markedly increased, although there were suggestions that the extent of disease was probably increased. Krause found that if tuberculous disease of low grade is once established in guinea-pigs a single attack of anaphylaxis does not bring about conditions that favor the extension of the disease and that anaphylactic shock suffered just before the inoculation of a nonpathogenic acid fast organism, the *Mist bacillus*, does not lay the body open to progressive invasion by this germ. No success attended the efforts to enhance the virulence of a certain strain of the tubercle bacillus when the method of Thiele and Embleton was followed. Evidence is submitted that tubercle bacilli can preserve their viability and their original virulence after being kept in a dried state for from fifteen to seventeen months.

80. General **Tuberculin Reaction.**—On the basis of Krause's experiments it seems to him reasonable to conclude that any tissue products if thrown rapidly into the circulation in unusual amounts will intoxicate an animal. In other words, one's own tissues, whether normal or pathologic, may conceivably poison one if they get into the blood stream in excess. Therefore, if the focal reaction, following a tuberculin injection, establishes a better circulatory give and take between the tuberculous focus and the animal organism, and, as it were, "unlocks" or "opens" the focus, the resultant symptoms of a general reaction may be due merely to substances that are primarily toxic for the organism. The same absorption bringing about symptoms of illness will occur whenever the conditions for focal absorption are enhanced, whether it be the more or less continuous absorption from a poorly invested focus or the occasional absorption following physical strain, intercurrent disease, or drug action, any of which may produce circulatory conditions about the focus that favor increased absorption.

83. **Action of Benzol.**—In connection with experimental work on the action of benzol, rabbits were given two or more daily subcutaneous injections of equal parts of olive oil and benzol. It was found that in all cases in which the animals survived the primary fall in the leukocyte curve there followed a primary rise which reached a normal level and in many instances reached the original level. This primary rise was always independently of any further injections, followed by a secondary fall, which in turn was followed by a secondary rise to a normal level. In the secondary fall the leukocyte curve almost invariably reached a level nearly as low as in the primary fall, and in some instances even lower. Further work has given similar results. The author's experience indicates that the mortality during the secondary fall is practically as great as during the primary fall. In all animals surviving the secondary fall there occurred a return of the leukocyte curve to a normal level, and there was no evidence of any subsequent falls. As a descriptive term appropriate for indicating the occurrence of the two periods of leukopenia above described Southard has suggested the term "diphasic leukopenia." The first period the authors designate as the "protophase"; the second as the "deuterophase."

84. **Urinary Phenols with Reference to Diphasic Leukopenia.**—The deuterophase of the diphasic leukopenia following subcutaneous injections of equal parts of olive oil and benzol, the authors found, is not accompanied by an increase in the phenol content of the urine, as is the protophase. These results seem to indicate that the deuterophase is not the result of "slowness of absorption of the poison" giving rise to "considerable variation" in the amount of poison existing at various times in the circulating blood; and that it is not due to delayed absorption.

86. **Studies on Circulation.**—In all over 200 hearts were injected by Ghoreyeb. In only one of all the casts obtained was an anastomosing vessel found between the right and left coronaries. As this vessel was larger in caliber than many of the smaller ramifications appearing in the casts, it was concluded that the failure to obtain more anastomosing vessels was principally due to the fact that very few existed. Ghoreyeb concludes from his study that while age causes an increase in the size and weight of the heart, there is no proportionate increase in the capacity of the coronary arteries.

88. **Fluid Medium for Isolation of Typhoid Bacilli from Stools.**—Teague and Clurman use a Congo-red brilliant green nutrient gelatin, that is, 4 c.c. of 2 per cent. Congo red with 0.083 + per cent. brilliant green. To inhibit the growth of some of those bacteria that are resistant to brilliant green without injuring the typhoid bacilli, bromoform is added. About 20 c.c. of bromoform are added to 100 c.c. of sterile distilled water. The mixture is shaken thoroughly and allowed to stand at room temperature over night. Then some of the saturated solution is pipetted into a sterile flask, care being taken not to disturb the bromoform at the bottom of the bottle or to include any of the globules of bromoform floating on the surface. One c.c. of the saturated solution is added to 10 c.c. of the Congo-red brilliant green gelatin immediately before inoculation with the feces. Meat infusion is used for the preparation of the nutrient gelatin. One-half per cent. of dextrose is added to further favor the rapid development of the typhoid bacilli present.

90. **Etiology of Rocky Mountain Spotted Fever.**—A parasite has been found by Wolbach in proved infected ticks in large numbers, morphologically identical with the parasite found in the lesions of guinea-pigs and monkeys infected with Rocky Mountain spotted fever. This parasite does not occur in the tissues of ticks proved to be noninfective. Wolbach believes that the distribution of the parasite in the infected ticks indicates that the transmission occurs by way of the salivary gland secretions. Transmission by fecal contamination of the wound caused by the tick does not seem possible because of the character of the tick's feces.

Journal of Pharmacology and Experimental Therapeutics, Baltimore

September, VIII, No. 9

91 Central Action of Curare. H. McGuigan, Chicago.—p. 471.
92 *Spontaneous Liberation of Epinephrin from Suprarenals. G. N. Stewart and J. M. Rogoff, Cleveland.—p. 479.
93 *Influence of Suprarenals on Kidneys. E. K. Marshall, Jr., and D. M. Davis, Baltimore.—p. 525.
94 Pharmacology of Vas Deferens. J. A. Waddell, Charlottesville, Va.—p. 551.

92. **Liberation of Epinephrin from Suprarenals.**—The spontaneous liberation of epinephrin was studied by Stewart and Rogoff (in the cat) by means of the (denervated) eye reactions and the blood pressure changes caused by blood from the suprarenals when permitted to pass into the circulation from a pocket of the vena cava in which it has been collected in known amounts and for known periods of time. The amount of epinephrin spontaneously liberated in cats was

found to vary in different experiments within a rather narrow range considering the differences in the conditions from 0.0008 to 0.0028 mg. per minute per animal, or from 0.0003 to 0.001 mg. per minute per kilo of animal. After section of both sympathetic trunks in the thorax near the diaphragm, including the major splanchnics, the spontaneous liberation of epinephrin is completely abolished. Division of the major splanchnics in the abdomen does not necessarily cause total cessation of the secretion in all cats. In one animal a detectable amount was still liberated but the liberation was entirely stopped when all the fibers coming to the semilunar ganglion were cut. The fall of blood pressure caused by section of both splanchnics has nothing to do with the failure of the suprarenals to liberate epinephrin. For when the nerves of the right gland are alone divided and the left suprarenal vein clipped, the blood collected from the right suprarenal in the cava pocket yields no epinephrin reactions on release of the pocket. Although, as is known, cats survive indefinitely the removal of one suprarenal and division of the nerve supply of the other, no detectable epinephrin was found in the blood coming from the remaining suprarenal five weeks after the operation. Good reactions were obtained on massaging the gland. No increase in the epinephrin liberation was detectable when sensory nerves (brachial) were stimulated. If any increase was produced by asphyxia in the authors' observations it was very slight.

93. **Influence of Suprarenals on Kidneys.**—The results of Marshall's and Davis' operations confirm in general experience of Elliott and other previous workers on suprarenal problems. Their animals have always succumbed after complete operations, with symptoms similar to those described in the literature. Cats, from which both suprarenal glands have been completely removed by the interval method and precautions employed by Elliott, have survived from one to seven days. The urea concentration in the blood rises after complete removal of the suprarenals to about twice the normal value and remains approximately stationary at this level until shortly before death when it again rises. The phenolsulphonephthalein excretion shows a tendency to diminish after suprarenalectomy. Cats with both suprarenals removed excrete much less urea and creatinin in the urine after an injection of these substances than normal or singly suprarenalectomized animals. The kidneys of suprarenalectomized animals show no noticeable histologic change from the normal, but those of suprarenalectomized animals which have received an injection of urea, creatinin and sodium chlorid show a striking change from the control animals. The nitrogen excretion in the urine of suprarenalectomized cats is slightly diminished after the operation; the diminution being accounted for by the retention of nitrogen products in the organism. There is hence no marked change in protein catabolism. These facts the authors regard as indicating a marked lowering of kidney efficiency in suprarenalectomized cats. This may occur with a normal blood pressure, and when the animals are in excellent physical condition.

Kentucky Medical Journal, Bowling Green

September, XIV, No. 9

95 Empyema. P. F. Barbour, Louisville.—p. 478.
96 Metastatic Infection of Bone. C. B. Spalding, Louisville.—p. 480.
97 Monstrosities and Congenital Deformities. C. K. Beck, Louisville.—p. 484.
98 Cases of Insanity Selected from Long and Busy Practice. J. W. Crenshaw, Cadiz.—p. 486.
99 Crime as Disease; Its Treatment. J. L. Carter, Whitesville. p. 488.
100 Intussusception in Adult; Report of Case. W. L. Gambill, Jenkins.—p. 492.
101 Report of Louisville Vice Commission. T. H. Mulvy, Louisville. p. 493.
102 Twilight Sleep. J. E. Wilson, Butler.—p. 499.

Laryngoscope, St. Louis

September, XXVI, No. 9

103 Psychologic Study of Deaf Child. M. A. Goldstein, St. Louis. p. 1129.
104 Auditory Reeducation. T. J. Harris, New York.—p. 1139.
105 Experimental Treatment of Three Congenitally Deaf Children with Sonorous Vibrations. L. M. Hubby, New York.—p. 1152.
106 Present Status of Carcinoma with Special Reference to Head and Neck. J. C. Beck, Chicago.—p. 1158.
107 Impacted Foreign Body in Trachea. C. J. Imperatori, New York. —p. 1176.
108 Diffuse Diabetic Ulceration of Pharynx and Larynx. H. Arrowsmith, New York.—p. 1177.

Maine Medical Association Journal, Portland

September, VII, No. 2

109 Oxygen and Cancer. C. R. Burr, Portland.—p. 41.
110 Climate of Maine. W. T. Rowe, Rumford.—p. 52.

Medical Record, New York

September 30, XC, No. 14

111 Syphilis of Nervous System. J. A. Fordyce, New York.—p. 575.
112 Present Methods of Excreta Disposal in Rural Schools. J. A. Nydegger, Baltimore.—p. 580.
113 Economic Value of Speech Correction. I. S. Wile, New York. p. 583.
114 Treatment of Inoperable Carcinoma by Bipolar Ionization. G. B. Massey, Philadelphia.—p. 585.
115 Three Cases of Acute Anterior Poliomyelitis Treated Successfully by Transfusion of Citrated Normal Blood of Adults. G. A. Rueck, New York.—p. 587.
116 Discharging Ear. A. Bardes, New York.—p. 588.
117 Climate; Its Use and Abuse in Treatment of Tuberculosis. J. B. Fish, Los Angeles.—p. 591.
118 Device for Drawing Small Amounts of Blood. H. B. Bayles, Brooklyn.—p. 592.

New York Medical Journal

September 30, CIV, No. 14

119 Injuries of Chest During War. R. M. Leslie, London.—p. 625.
120 Extensive Subdural Hemorrhage After Trauma. B. Sachs and C. A. Elsberg, New York.—p. 633.
121 Infantile Paralysis. H. C. Frauenthal, New York.—p. 635.
122 Afterthoughts of Epidemic of Infantile Paralysis. B. Robinson, New York.—p. 638.
123 Pelvic Massage. F. Herb, Chicago.—p. 639.
124 Inflammation with Regard to Its Stage. J. F. X. Jones, Philadelphia.—p. 640.
125 Rectal Operations Under Local Anesthesia. J. F. Saphir, New York.—p. 644.
126 Treatment of Inebriates. J. McIver, Philadelphia.—p. 646.
127 Acute Middle Ear Suppuration. J. J. O'Brien, Schenectady. —p. 649.
128 Wake of Wassermann Test. J. C. Minor, Hot Springs, Ark. —p. 651.

South Carolina Medical Association Journal, Greenville

September, XII, No. 9

129 Development of Science of Diagnosis. L. F. Barker, Baltimore. —p. 278.
130 Rational Treatment of Cardionephritic Cases. N. B. Heyward, Columbia.—p. 285.
131 Home of Uncured and Some of Results of Head Cold. C. W. Kollock, Charleston.—p. 292.

Tennessee State Medical Association Journal, Nashville

September, IX, No. 5

132 Routine in Eye Work. G. C. Savage, Nashville.—p. 189.
133 *Solar Treatment in Affections of Bones and Joints. W. C. Campbell, Memphis.—p. 199.
134 *Percy Cautery Treatment of Inoperable Carcinoma of Uterus; Report of Cases. E. T. Newell, Chattanooga.—p. 203.
135 Cardioneuroses. S. T. Rucker, Memphis.—p. 208.
136 Progress in Treatment of Crippled and Deformed. R. W. Billington, Nashville.—p. 211.
137 Intractable Gonorrhea. G. R. Livermore, Memphis.—p. 215.

133 and 134. Abstracted in THE JOURNAL, April 22, p. 1348.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Children's Diseases, London

September, XIII, No. 153

1 *Case of Gastro-Enteritis Due to Bacillus Proteus. W. Boxwell.—p. 257.
2 *Case of Prolonged Hyperpyrexia in Child with Midbrain Tumor. C. V. Turner.—p. 261.
3 Glandular Carcinoma of Uterus in Child Aged Two and One-Half Years. J. E. Adams.—p. 266.

1. **Gastro-Enteritis Due to Bacillus Proteus.**—The striking features of Boxwell's case were a sudden attack of gastro-enteritis, with sharp hemorrhage from the bowel; high fever and delirium; pain in the muscles and joints; transient paralysis of the limbs, probably of toxic origin; an acute bedsore, long protracted fever of a hectic type with extreme emaciation; the reaction of her blood to a proteus like organism recovered from her feces; and the almost dramatic

improvement and ultimate recovery after the administration of a vaccine made from this organism. Boxwell believes that this must have been a genuine case of infection with *Bacillus proteus* because in nearly every important particular the morphology and biology of the organism obtained from the feces corresponded with that of *B. proteus*.

2. **Case of Prolonged Hyperpyrexia.**—The temperature was the most remarkable feature of Turner's case; it was irregular and intermittent throughout, showing great variations at times; once, or sometimes twice, every twenty-four hours it would rise to 105, 106 or 107 F., and then rapidly fall, so that in eight or twelve hours it would be normal or subnormal. The maximum was per axilla, 109 F. and per rectum 111 F. Four hours later it was down to 100 F., and in eight hours it was normal. The rises occurred most frequently at 11 p. m., but this was not constant; the temperature never fell below 97 F. The pulse rate varied in proportion with the temperature; it became uncountable when the temperature was high, and only 80 to 100 when the temperature was down; the respiration rate showed corresponding variations. During the last week the respirations were grouped, and became Cheyne-Stokes in character before death. Diarrhea, vomiting and marked wasting were terminal features; for forty-eight hours before death the extremities were icy cold, and the last twenty-four hours the temperature was so low as to be unregisterable by an ordinary clinical thermometer. Post-mortem, a solid rounded tumor was found situated in the middle in the region of the corpora quadrigemina.

British Medical Journal, London

September 9, II, No. 2906

4 [illegible]ational Number.—p. 345.

Edinburgh Medical Journal

September, XVII, No. 3

5 [illegible]block or Gibbus Pelvis (Kyphotic Pelvis; Kyphosis Pelvis). [illegible]. B. Hart.—p. 150.

6 [illegible]s of Surgical Cases: Paget's Disease of Nipple, Coccygeal [illegible]d, Tumor, etc. J. C. Burns.—p. 161.

7 [illegible] of Progressive Subcutaneous Edema. D. M. Greig.—p. 187.

Indian Journal of Medical Research, Calcutta

July, IV, No. 1

8 [illegible]e of Blood and Sugar in Urine in Varying Conditions of [illegible]lth in Bengali. D. McCay.—p. 1.

9 [illegible]tion of Tubercle Bacillus Directly from Sputum and Post-[illegible]em Material. M. B. Soparkar.—p. 28.

10 [illegible]s of Certain Modifications of Wassermann Reaction Due [illegible] Variation in Complement Content. H. C. Brown and K. R. K. [illegible]ngar.—p. 41.

11 [illegible]tion of Origin and Mode of Spread of Epidemic of Diarrhea, [illegible]ysentery and Cholera in Poona. J. Morison and E. C. R. [illegible]. p. 49.

12 [illegible] Ankylostoma in India and Ceylon. C. Lane.—p. 74.

13 [illegible] Dacnitis Dajardin, 1845. C. Lane.—p. 93.

14 [illegible]. J. W. Cornwall.—p. 105.

15 [illegible] Anopheline with Unspotted Wings from Mesopotamia [illegible]Culex Lukisii). S. R. Christophers.—p. 120.

16 [illegible] in Flies. Study of Specific Differences in Genus Musca. [illegible] Other Than Genitalia. P. R. Awati.—p. 123.

17 [illegible] of Osteomalacia in India. A. C. Scott.—p. 140.

18 [illegible] Content of Urine and Blood with Special Reference to [illegible] Variation in Osteomalacia. A. C. Scott.—p. 169.

19 *Experimental Production of Congenital Goiter. R. McCarrison. —p. 183.

20 Malaria in Muscat. C. A. Gill.—p. 190.

14. **Kala-Azar.**—All attempts made by Cornwall to make bugs, infected with *Leishmania*, transfer the infection by biting either to a sterile culture medium or to an animal, failed. Degenerated forms of *Leishmania* and free flagella are found in the intestine and rectum of *Cimex rotundatus* but no viable resistant cystic forms could be demonstrated in either the rectum or the feces of *Cimex*. On the other hand, infected bugs may be devored by some other insect or by a vertebrate and the infection somehow passed on to man. If no such bug eater which is capable of transferring the infection can be found, some insect host other than the bug must be sought for. Resistant forms, which are capable of becoming flagellates when fresh nutriment is supplied to the bug, do not remain in the stomach of either the nymphal or adult *Cimex* after the flagellate infection has died out. No indications of an intracellular phase of *Leishmania* in the stomach of *Cimex* were met with by Cornwall. The fresh serums of man, goat, sheep and guinea-pigs are all inimical to flagellates of *Leishmania;* those of rabbit, dog, hen and cat seem to have little ill effect. The inimical action of a serum is destroyed by heating it to 55 C. for 30 minutes. The parasites of an oriental sore are all intracellular, so *Cimex* can only infect itself when the parasite is in the circulating blood, and not directly by biting the lesion. Cornwall points out that this investigation brings into prominence once again two things, first, our lack of definite knowledge concerning the bionomics of common insects, such as bugs, and the wide field that exists for close observations of the habits, life history, food supply and natural enemies of the insects and small vertebrates that frequent our houses. Second, it is clear that for the elucidation of problems in the insect transmission of disease the close cooperation of a committee consisting of a medical man, an entomologist, and a zoologist is a desideratum.

19. **Experimental Production of Congenital Goiter.**—Three classes of goats were under McCarrison's observation: Class *A*, included twelve female goitrous goats, intimately mixing one with another, and to all of whom cultures from the feces of goitrous individuals were administered daily throughout the experiment. Class *B*, included eight female goats of the same age, but isolated one from another, and receiving no cultures. These were further subdivided into four which were muzzled and four which were not muzzled. Class *C*, comprised one young female goitrous goat living in the animal houses of the institute within a distance of a few yards from those of class *B*. All these were impregnated during the same season by the same male, while in every other respect their conditions of life were identical. The only factors, then, to which differences of results could be attributable were: (*1*) intimate contact, (*2*) muzzling, (*3*) the presence of goiter in the mothers of classes *A* and *C*, and (*4*) the administration of the cultures. With regard to the mothers themselves; it was not observed that the goiters of those in the first and third classes underwent any considerable increase in size during pregnancy. Among the mothers in class *B*, however, two of the unmuzzled animals developed small goiters during pregnancy. With regard to their offspring 100 per cent. in the first class were goitrous, while 90 per cent. were stillborn, macerated, hairless, ill developed and goitrous, death having been intra-uterine.

In the second class, on the other hand, none of the offspring showed all these pathologic characteristics at one and the same time. Three of the five kids born in this class were perfect in health and development, that is 60 per cent. One had a slight goiter which disappeared shortly after birth. A fourth was stillborn and goitrous, but as it was otherwise well developed, covered with a thick coat of healthy hair and showed no signs of maceration its death was probably extra-uterine. The fifth was born prematurely but was not goitrous. Its premature birth might well have been due to influences quite outside the scope of the present experiment. The kid born of the mother in the third class was perfectly healthy; its thyroid was palpable, but there was no goiter. Among the nine control animals, therefore, six had offspring. Of the kids born 66.6 per cent. were living and healthy, 33.3 per cent. were stillborn, while 33.3 per cent. were goitrous at birth. In neither of the two kids born with goiter did the enlargement reach the size of the majority of cases in class *A*. McCarrison believes, therefore, that his previous conclusion is confirmed, namely: That congenital goiter is due to the action on the fetal thyroid of toxic substances derived from the maternal intestine. These substances are the products of micro-organisms originating in fecally contaminated soil which are conveyed to man and animals by infected food and water.

Journal of Tropical Medicine and Hygiene, London

September 1, XIX, No. 17

21 Cercariae of Natal. F. G. Cawston.—p. 201.

22 Dermatitis Due to Secretion of Beetle in British East Africa. P. H. Ross.—p. 202.

Archives des Maladies du Cœur, etc., Paris

September, IX, No. 9, pp. 377-424

23 *Drug Tests of Bradycardia. (Critique de l'emploi des épreuves de l'atropine et due nitrite d'amyle dans le diagnostic des bradycardies.) H. Frédéricq.—p. 377.
24 *Comparison of Diastolic Pressure in Different Arteries. (Du niveau de la pression diastolique mesurée au Pachon dans les différentes artères des membres.) J. Heitz.—p. 382.
25 The Low Blood Pressure in the Pregnant. (Grossesse et tension artérielle.) C. Doljan.—p. 388.

23. **Drug Tests of Bradycardia.**—Frédéricq protests against the generally accepted view that when the heart beat in bradycardia is accelerated by atropin and amyl nitrite the trouble is of nervous origin, while a myocardial origin is assumed when these tests give negative findings, that is, when there is no acceleration. Wenckebach seems to be the only one who has raised his voice in protest against this assumption, Frédéricq says, and he reports the results of some experimental research which sustain this protest. A positive result, namely, a notable acceleration of the pulse after administration of these drugs proves merely that the physiologic tonus of the vagus nerve is not abolished; not at all that this tonus is unduly exaggerated. The rhythm of the heat is determined by a number of factors, and the normal inhibiting action of the vagus plays certainly some part in it. But this is not necessarily the factor that determines the bradycardia. Whatever the cause of the bradycardia, however, as long as the vagus has its physiologic tonus, its suppression by these drugs will accelerate the abnormally slow rhythm. Frédéricq induced bradycardia in dogs by moderate compression of the region of the bundle of His, thus inducing a condition similar to the clinical permanently slow pulse from dissociation of the auricle and ventricle action. The nerve control of the myocardium was not interfered with. Arresting the nerve control with atropin, amyl nitrite or severing the vagus then accelerated the ventricle beat. This disproves that a nervous origin is necessary to explain the positive response to these drug tests.

24. **Diastolic Pressure in Different Arteries.**—Heitz gives a table showing the diastolic pressure at approximately the same time in the humeral and radial arteries and in the femoral and tibial, on each side. Surprising differences were found, even in arteries on the same side. This renders it necessary in recording cases to mention on which artery the blood pressure was measured and how high up on the artery.

Bulletin de l'Académie de Médecine, Paris

September 5, LXXVI, No. 35, pp. 167-182

26 *Prophylaxis of Tetanus. (Au sujet de la prevention du tetanos par le serum antitoxique.) Vaillard.—p. 167.
27 Serotherapy in Diphtheria. Delearde.—p. 173.
28 Tests of Reserve Power of the Heart. (Epreuve d'aptitude cardiaque à l'effort.) C. Lian.—p. 176.
29 Carbon Tetrachlorid for Cleansing the Skin Around a Wound. (Dégraissage de la peripherie des plaies de guerre, par le tetrachlorure de carbone.) L. Mac Auliffe.—p. 180.

26. **Prophylaxis of Tardy Tetanus.**—Vaillard analyzes the various experiences with tetanus developing months after the injury and after preventive inoculation of antiserum. It has been proved in this way that the tetanus spores are not destroyed by the usual antiseptics, but only by being incorporated by the leukocytes and digested by them. They have been found nonmotile but with apparently unimpaired vitality in leukocytes six months after the injury, in experimental research on dogs and in the clinic. A wound infected with tetanus spores may develop tetanus long after it has apparently healed. The danger is most imminent when a foreign body infected with the germs is in muscle tissue. With dogs under these conditions it proved absolutely impossible to ward off tetanus with antiserum injections; its development was only postponed a little. The practical conclusions from his study of the subject are that the primary injection of the antiserum should be proportioned to the severity of the wound. The doses should be large, especially when there are foreign bodies in the wound whose removal is not practicable at once. In twenty-six of the 105 cases of tardy tetanus of which he has records, the tetanus developed in connection with some secondary operation in the region of the wound incurred from twenty days to six or even ten months before. In other cases the tetanus developed after some sequester or foreign body had been mobilized in the tissues or cast off. The eliminating process seems to have had the same effect in rousing the slumbering germs as an operative procedure. In another group of cases the tetanus came on from one to four months after the wound, which had continued to suppurate. In these cases of interminable suppuration, an occasional injection of antiserum might have warded off the disease. In a few cases the tetanus developed from forty-nine days to three months after the wound and it had apparently healed and a definite scar had formed. Two men in this group had been doing exercises for mechanotherapy and two others had been severely chilled through on some occasion. Nothing can be suggested in prophylaxis for such cases, but it is evident that a preventive injection of the antiserum is called for before any secondary operation on the wounded, and when there is reason to suspect that a foreign body or sequester is moving about. To avoid possible danger of anaphylaxis, the antiserum might be injected by the small preliminary, "refractory dose" method. In conclusion he reiterates that the biologic phenomena are too complex for any of our preventive measures to be absolutely infallible in their action.

Paris Médical

September 2, VI, No. 36, pp. 181-224

30 *War Psychoses. (Psychoses hystéro-émotives de la guerre.) H. Claude, M. Dide and P. Lejonne.—p. 181.
31 *Nervous Phenomena from Explosion Nearby. (Les troubles nerveux déterminés par la déflagration des explosifs.) G. Roussy and J. Boisseau.—p. 185.
32 *Rapid Rhythmic Spasms of the Diaphragm. (Chorée du diaphragme d'origine hystérique.) Simonin and Chavigny.—p. 191.
33 *Dual Personality Controlling the Gait as a War Psychosis. (Troubles de la marche consécutifs aux émotions et commotions de la guerre.) M. Laignel-Lavastine and P. Courbon.—p. 192.
34 Secondary Contracture after War Injury of Peripheral Nerves. (Hypermyotonie ou contracture secondaire dans les paralysies des nerfs périphériques par blessure de guerre.) A. Thomas.—p. 203.
35 *Sequels of War Wounds of the Head. (Le syndrome psychique résiduel des traumatismes cranio-cérébraux de la guerre.) M. Villaret and M. Mignard.—p. 209.
36 Electrodiagnosis in Wartime. (Considérations sur l'électrodiagnostic de guerre.) Larat.—p. 215; (Interprétation des discordances entre les réactions électriques et les signes cliniques dans les lesions nerveuses peripheriques.) J. Chiray, G. Bourguignon and Dagnan-Bouveret.—p. 220.

30. **War Psychoses.**—Claude and his coworkers cite some typical cases, explaining the trouble by exclusion as a hysteric neurosis created by emotional stress on a constitutional predisposition and perpetuated by dread of being sent back into danger.

31. **Nervous Disturbances from Explosion Nearby.**—Roussy and Boisseau report some of their 133 cases of this kind among 1,300 war patients in nine months. None had any signs of external injury. In the vast majority of the cases the disturbances were of the hysteric type, all curable at once by psychotherapy.

32. **Chorea of the Diaphragm.**—The extremely rapid rhythmic contraction of the diaphragm, in two cases related, developed after recurring pleurisy or the chest had been kicked by a horse. The clinical picture in the recurring attacks was identical with that described by old writers as "dyspnea and cough from diaphragmatic spasm" or "chorea of the diaphragm." Roentgenoscopy in one case showed that the right and left halves of the diaphragm rose and fell alternately. Both cases date from long before the war, although both were in soldiers.

33. **Disturbances in the Gait as a War Psychosis.**—In this study of the locomotor disturbances in those the writers call the *émotionnés*, and the *commotionés* of the war, one characteristic is manifest through the manifold varieties of such disturbances. This characteristic is the ease and promptness with which these disturbances settle into established habits, and the difficulty of breaking up these habits. It seems as if the locomotor automatism has actually escaped beyond the influence of volition. In short, they say, there is a more or less complete dual personality so far as the gait is concerned.

35. **Sequels of Wounds of the Head.**—Villaret and Mignard have kept under surveillance to date the 350 cases of brain wounds which have passed through their neurologic service at a base hospital. In no instance has the destruction of brain tissue been followed by any characteristic form of insanity or the syndrome of true dementia, idiocy or imbecility. To date, the only sequels seem to be a syndrome of sluggish psychic action and early fatigue from mental effort, while the intellect, emotions and will can be evoked at any time. There may be occasional brief periods of confusion, suggesting the psychic equivalents of epilepsy. The location of the wound does not seem to have any influence on this residual psychic syndrome.

Presse Médicale, Paris

September 7, XXII', No. 49, pp. 389-396

37 General Principles for Making Artificial Legs. (Quelques principes pour la prothèse du membre inférieur.) A. Broca.—p. 389.

38 Alkaline Chalybeate Mineral Water in Treatment of Hard Edema. (Guérison des oedèmes durs traumatiques et phlébitiques par les injections sous-cutanées d'eau du Breuil.) Denis.—p. 390.

39 Colloidal Metals in Treatment of Typhus and Relapsing Fever when Serotherapy is Not Available. (Traitement du typhus exanthématique et du typhus récurrent par l'or et l'argent à l'état colloidal.) J. Bouygues.—p. 391.

40 Prophylaxis of Tardy Tetanus by Reinjection of Antiserum. (La prévention du tétanos par le sérum antitoxique.) Vaillard.—p. 393. See abstract 26 above.

September 11, No. 50, pp. 397-404

41 *Periodic Vomiting with Acetonemia Not a Form of Appendicitis. A. B. Marfan.—p. 397.

42 Cartilage to Close Gap in Skull. (Technique opératoire de la cranioplastie cartilagineuse.) Villandre.—p. 399.

43 Sandals to Wear Over Shoes to Correct Varus. (Les patins correcteurs contrevarus et contre-équin.) L. Lortat-Jacob and P. Meunier.—p. 400.

41. **Periodic Vomiting with Acetonemia.**—Marfan says that he has never known a case of this kind developing for the first time after the age of 10. The first attack may occur during the first months of life or at any time between this and 10, and they never return after puberty. We must assume that some abrupt disturbance in the nutritional interchanges sets at liberty some substance that has an emetic action, causing the vomiting, while at the same time the fats are split and an excess of fat acid is thrown into the circulation, overtaxing the liver and permitting the passage of acetone into the blood. The disturbance in the nutritional interchanges resembles in many respects that from chloroform poisoning. It occurs almost exclusively in children with an inherited neuro-arthritic taint, and is favored by a diet rich in fats. The theory that the appendix is a factor is disproved by twenty-one cases which he reports in detail, all in children who had had the appendix removed. In some cases the attacks had long preceded and continued after the appendicectomy. In others they developed for the first time a few months to a year afterward. In some cases it may be difficult to differentiate the periodic vomiting from acute appendicitis, but with the latter the temperature is abnormally high and the acetonemia is slight, inconstant and tardy, as it results merely from the lack of food, and the abdomen is distended and tender at certain points. Appendicitis also is rare in children under 5. Sometimes palpation through the rectum may clear up the diagnosis. In case of doubt it is wiser to act as if appendicitis were certain, as in several of the cases reported the two affections coexisted.

42. **Cartilage Implant to Close Gap in Skull.**—Villandre describes with illustrations how he shovels out scraps of cartilage from the sixth, or seventh costal cartilage, using a bistoury with bayonet handle. The gap is filled with from two to five of these scraps, and they are held in place by catgut passed back and forth through the edges of the periosteum of the skull and inner layer of the scalp, thus forming a grating over the scraps in the gap.

Progrès Médical, Paris

August 29, XXXI, No. 16, pp. 137-144

44 *Prophylaxis of Gas Gangrene. (Etude histologique sur un cas de gangrène gazeuse au debut. Considérations thérapeutiques.) M. Sénéchal.—p. 137.

45 Narrow Steel Arches and Supports to Bridge Opening in Plaster Casts. (La transformation de nos appareils plâtrés en chirurgie de guerre.) P. Barbarin.—p. 140.

September 5, No. 17, pp. 145-162

46 *Reeducation of Functional Deafmutism. (L'audi-mutité rebelle, d'origine émotionnelle.) M. Briand and J. Philippe.—p. 145.

47 *Uremic Origin of Nervous Complications in Typhoid. (Fièvre typhoïde ataxoadynamique et urémie cérébrale.) G. Jouve-Balmelle.—p. 149.

48 Injury of the Eyes from Gases. (Lésions oculaires consécutives à l'action des gaz lacrymogènes.) P. Gremeaux.—p. 157.

49 Jointed Litter for the Trenches. (Brancard à bras articulés pour le transport des blessés dans les tranchées.) G. Lefrou.—p. 159.

50 Cardboard Temporary Prothesis for the Leg. (Le pilon provisoire à l'hôpital danois.) E. A. Tscherning.—p. 160.

44. **Incipient Gas Gangrene.**—Sénéchal reproduces seven microscopic fields taken from a case in which gas gangrene developed under his eyes. The focus of the inoculation is in the interfascicular cellular tissue of the muscle. Hence cleaning out with the bistoury the injured muscle tissues inoculated with the germ wards off gas gangrene. Even if it does develop, this early mechanical clearing out of the wound improves the general condition so that amputation gives better chances for survival.

46. **Reeducation of Emotional Deafmutism.**—Briand and Philippe report a case in detail to show the various steps in the reeducation of men who had lost the power of speech under emotional stress. They begin with rhythmic exercises in breathing, then in blowing out the light of a match, or a candle, then in blowing soap bubbles. The next step is to whistle, first one note, leading up slowly to whistling some very simple familiar tune. Then the vowels in turn, expatiating amply on the progress realized, but leaving actual speech to be casually rearoused spontaneously. In short, they emphasize, treatment must be insidious rather than with force.

47. **Uremic Complications in Typhoid.**—Balmelle reviews his eighteen months of experience in the typhoid ward of the Marseilles military hospital. Among the 600 typhoid patients, 14 per cent. had been supposedly effectually vaccinated and the typhoid averaged no milder in these than in the 86 per cent. who had not been vaccinated. Study of the blood showed an unusually high urea content in all the patients with extreme prostration, delirium and other nervous manifestations. All the patients with only slight and transient rise of the urea content of the blood soon threw off their nervous symptoms or they did not develop any. A number of curves are given to illustrate the importance of this uremia as the cause of the nervous complications in typhoid. He found also in two pneumonia patients 1.11 gm. urea to the liter of blood in one case and 1.48 in the other.

When he recognized this uremia in his typhoid patients, measures to combat it were at once instituted and prompt improvement followed. Before this, the mortality had been 23 per cent. among the 106 patients with typhoid of this "ataxo-adynamic type" as he calls it. When his assumption of uremia as the causal factor was confirmed by the laboratory, and treatment based thereon applied, the mortality since has been only 12 per cent. among seventy-four patients of this group, presenting, that is, from 0.6 to 4.6 gm. urea to the liter of blood. The uremia is evidently secondary to injury of the kidneys from the typhoid toxin. He applied the classic treatment for uremia, water internally and repeated venesection; as the urea content of the blood declined, the nervous phenomena improved to correspond. Sluggish pupil reactions and myosis may prove a warning sign. He noticed further that the uremia sometimes displayed a tendency to lower the temperature. The slow regular decline might mislead one to assume improvement if it were not for the coincident aggravation of all the other symptoms.

Gazzetta degli Ospedali e delle Cliniche, Milan

September 3, XXXVII, No. 71, pp. 1105-1120

51 *Lumbar Puncture of the Fetus During Podalic Extraction as Aid to Safe Delivery. (Puntura lombare nel feto, durante l'estrazione podalica nell'interesse della vita del feto stesso.) R. Costa.—p. 1109.

52 Compulsory Insurance Against Sickness. (Le assicurazioni obbligatorie contro le malattie.) E. Villa.—p. 1119.

51. **Lumbar Puncture of Fetus to Facilitate Delivery.**—Costa had long debated the possibility of relieving by lumbar puncture the pressure in the skull during feet-first delivery with contracted pelvis. He hoped with this to ward off intracranial hemorrhage with difficult delivery. In a recent case, a woman at term with conjugate of only 7.4 cm. in a totally contracted pelvis was being prepared for cesarean section when, to the surprise of all, the head presented and the child was delivered spontaneously and almost without effort. The explanation was found in spina bifida in the lumbar region, a myelomeningocele, through which cerebrospinal fluid had been squeezed out during the compression of the head as it emerged. The diameters of the child's head had been reduced from 8.8 to 7.4 cm. and 9.2 to 7.4 cm., the diameter at the base of the skull being 7.5 cm. The child showed no signs of asphyxia or symptoms from pressure on the brain, but died before the end of the week from the constant oozing of the fluid. No signs of intracranial hemorrhage or fracture could be discovered at necropsy.

After considerable experimental work on infant cadavers, showing the feasibility of lumbar puncture, he applied it in a case of podalic extraction with central placenta praevia. After combined version he slowly dragged the feet down until the anus presented and the tip of the spine could be forced into view. Lumbar puncture was then done, the softness and thinness of the tissues rendering it remarkably easy. No cerebrospinal fluid could be aspirated, only 0.25 c.c. of a reddish fluid escaped, but as the head entered the inlet, the fluid gushed from the needle hole, but it stopped at once as soon as the head emerged. The mother and child left the maternity a week later in the best condition. The os was unusually rigid in this case, and Costa is convinced that the lumbar puncture warded off serious complications for the infant. In his experiments on infant cadavers he found that the diameter of the head could easily be reduced by 0.5 cm. by lumbar puncture. He does not wait for further experience before calling attention to its possible advantages in certain rare cases.

Policlinico, Rome

September 5, XXIII, No. 36, pp. 1067-1094

53. Specific Precipitin Reaction in the Cerebrospinal Fluid in Meningitis. G. Sampietro.—p. 1067.

54. Experiences at Rome Hospital for the Wounded. (I feriti curati nell'ospedale di riserva al Policlinico nel reparto del prof. A. Alessandri, dall'agosto 1915 all'aprile 1916.) V. Grossi.—p. 1076. To be continued.

Grèce Médicale, Athens

XVIII, No. 5-6, pp. 9-12

55. *Radiotherapy of Inoperable Cancer of the Breast. Chilaiditi.—p. 9.

56. Fatal Hemorrhage from Eroded Artery in Duodenal Ulcer. Missirloglou.—p. 10.

55. **Radiotherapy of Mammary Cancer.**—In Chilaiditi's case the cancer had developed rapidly in the sixth month of a pregnancy. The tumor had infiltrated the breast, which was hard, as also the enlarged lymph glands in the axilla and supraclavicular and subclavicular regions, with other small nodules in the skin, and there was great emaciation. The findings in the mediastinum were also suspicious. The tumor retrogressed completely under intensive cross-fire exposure to the Roentgen rays. Three series of treatments were given, the last following after the birth of the healthy child. During the five months since the beginning of treatment there has been no sign of recurrence, all traces of the tumor had definitely subsided by the fourth week after the second series of exposures. To obtain the total dose of 60.0 H. after filtering through 4 mm. aluminum plus 5 mm. leather, the production of 4,000 H was necessary.

Semana Medica, Buenos Aires

XXIII, No. 24, pp. 653-676

57. Present Status of Carcinoma of the Esophagus. **C. P. Mayer.**—p. 653.

No. 28, pp. 25-52

58. *Foreign Body in the Ear of a Child. (Contribucion al estudio de los cuerpos extraños del oido en el niño.) **A. S. Lagomarsino.**—p. 32.

59. *The Blood Picture in Parturients. (Hematologia en obstetricia.) **T. A. Chamorro.**—p. 33.

No. 29, pp. 53-80

60. *Deratization with Small Portable Apparatus. (El nuevo aparato raticida tipo "Parque Sanitario.") **F. Otero.**—p. 53.

61. *Hematology of Twenty-One Multiparae at Term. (Hematologia en obstetricia.) **T. A. Chamorro.**—p. 57.

58. **Foreign Body in the Ear of a Child.**—Lagomarsino cites some cases on record in which a bead or even a sharp edged foreign body had remained in the ear for years without appreciable injury. His extensive experience has confirmed anew and repeatedly that the injury from a foreign body is almost invariably due to hasty and ill advised attempts to extract it, before the physician sees the case.

59. See abstract 61.

60. **Gas Rat-Killing Apparatus.**—An illustrated description is given of the small apparatus that has been devised by Penna, chief of the public health service, to kill rats in their holes. It looks like a syringe, a cartridge containing the mixture that produces the gases fitting into the syringe-like body almost like a piston, while the long tip of the syringe is run far down into the hole. The earth is stamped down around it and wherever any smoke can be seen escaping, the earth is stamped down to hold in the gases. A handle parallel to the body of the apparatus permits it to be handled when hot. The mixture found most powerfully asphyxiating is made of 38.52 gm. potassium nitrate (KNO_3); 6.67 gm. vegetable charcoal; 8.10 gm. sulphur; 17.98 gm. white arsenic, and 8.73 gm. tar (*alquitran*). The whole forms 80 gm. of a mixture which, as it burns, generates the gas $SO_2+As_2O_3+CO$. The health service has 200 of these little apparatus ready, with 75,000 of the cartridges. One is usually enough but several may be required for long, winding holes. Rats in cages die when the jet of escaping gas is turned on them even in the open air.

61. **The Blood Picture in the Pregnant and in Parturients.**—Chamorro relates that in his study of 106 specimens of blood from nearly this number of pregnant or parturient women, the red blood corpuscles showed little change from ordinary conditions. The leukocytes showed the most change, both in numbers and quality. The numbers were above normal during pregnancy in general, and grew still higher during delivery, slowly returning to normal afterward. The increase is mostly in the polynuclears. This leukocytosis may persist for three weeks after delivery, and may be regarded as a favorable sign. It is more pronounced in primiparae, the polynucleosis in multiparae. Protracted delivery with much pain leads to disappearance of the eosinophils. His report has been published serially, with tabulated details.

Russkiy Vrach, Petrograd

XV, No. 28, pp. 649-672

62. Influence of Asphyxiating Gas, Phosgen, on Animal Organism. (O vliani phosgena na organizni zhivotnikh.) **B. I. Slovtzoff.**—p. 649.

63. Leukocyte Picture in Guinea-Pigs only Slightly and Briefly Modified by Removal of Thymus. (Beztsvietnia kroveyania tieltsa pri udalenii vilochkovoi zhelezi.) **A. E. Selinoff.**—p. 652.

64. *Dietetic Treatment of Gastric Hyperacidity. **P. I. D. Sushtshevskaia.**—p. 656. Concluded in No. 29.—p. 679.

65. Enucleation of the Eyeball with Transplantation of Fat and Muscle Tissue; Two Cases. (Udalenie glaznogo yabloka s peresadkoi zhira i glaznikh muishts.) **V. N. Preobrazhenski.**—p. 660.

64. **Dietetic Treatment of Chronic Gastric Hyperacidity.**—The other half of this article was reviewed in these columns on page 1122. The extremely encouraging results obtained by simple dietetic restrictions are described in detail. Four men from 27 to 62 years old and two women of 24 and 48 had long suffered from severe pains an hour or two after eating, with other disturbances from hyperacidity. A gradual clinical cure was realized by allowing them exclusively whites of eggs and butter. In a typical case in a man of 30, the Ewald test breakfast showed total acidity of 75 and free hydrochloric acid 45 at the commencement of the course. One white of egg in the morning and 20 gm. butter in the evening were all that was allowed at first. The amounts were increased until by the eighth day he was getting eight

whites in the morning and 160 gm. butter in the evening, and these amounts were continued for four days. At the twelfth day, the test breakfast showed only 40 and 16 for the acidity figures. Four whites and 50 gm. butter were then made the daily ration, supplemented by 500 gm. potatoes in fluid form and the patient regained what he had lost in weight. The potato soup was then given twice a day, and the patient was discharged from treatment the twentieth day materially benefited. The charts of each case are given, showing the improvement from thus resting the stomach, making as little demands on it as possible, and soothing it. The acidity ran up again when anything else, even skimmed milk, was allowed until the secretory function had been permanently stabilized.

The writer quotes Boas' statement that no authentic case is on record in which hyperacidity was permanently reduced by dieting alone, and says he is mistaken. In Meyer's negative research in this line, milk was given. But milk has a decided tendency to increase the acidity, and hence his tests are not conclusive. On the diet reported here, whites of eggs and cream butter, all without salt and without water, given separately, morning and evening, the subjective improvement was remarkable, the relief from pain and the absence of complaints of thirst. The output of urine was much reduced on this diet, and the patients lost some in weight and did not feel quite so strong as usual, but when they changed to the carbohydrate-fat diet they soon regained what they had lost and surpassed their former weight. One patient, after the secreting function had been stabilized, while still on the carbohydrate-fat diet, was tested with an acid-stimulating meal, two glasses of milk, nearly a pound of white bread and a cutlet, but no disturbances followed suggestive hyperacidity.

Nederlandsch Tijdschrift voor Geneeskunde, Amsterdam

September 2, II, No. 10, pp. 805-900

66 *Medical Education. IV. (Nadere beschouwingen over de beteekenis en inrichting van het praeclinische onderwijs: Het wetenschappelijk peil van de colleges en het nut der practica.) G. van Rijnberk.—p. 805.

67 *Importance for Delivery of the Connection Between the Amnion and the Chorion. (De verbinding tusschen het amnion en het chorion en haar praktische beteekenis bij de baring.) J. Nijhoff.—p. 808.

68 *Segmentation of the Spinal Nerve Segmental Zones in the Cat. (De bouw en verdeeling der rompdermatomen bij de kat.) S. de Boer.—p. 817.

69 *Fibrin-ferment, Element in Coagulation of Blood. (Nog eens over fibrine en het wezen der bloedstolling.) E. Hekma.—p. 831.

70 *Treatment of Epidemic Cerebrospinal Meningitis. C. J. H. T. [illegible]—p. 848.

71 Treatment of Inflammatory Processes in the Orbit. (Aanwijzingen voor de behandeling der oogkasontsteking.) F. H. Quix.—p. 854.

72 Endonasal Treatment of Frontal Sinusitis. (Endonasale behandeling der aandoeningen der voorhoofdsholten.) A. de Kleyn.—p. [illegible]

73 Paroxysmal Hemoglobinuria; Two Cases. J. Lankhout.—p. 856.

66. **Medical Education.**—Van Rijnberk is professor of physiology at the University of Amsterdam and in this, his fourth discussion of this subject, he comments on the views of Lyon and of Barker on medical education, as published in THE JOURNAL, Feb. 26, 1916, pp. 629 and 631. He has been translating them for the readers of the *Tijdschrift*, of which he is editor, and remarks that it delights him beyond measure to find that his own ideas—which seemed too utopian to be ever realized—are being advanced and even surpassed by instructors in America, "that land of the utilitarian and the practical." He says "My predecessor used to say that he adapted his instruction so that the stupidest member of the class could follow it, knowing that the best could always get something out of it. But I think this is the wrong principle. The teaching should be adapted to the best minds in the class. This stimulates them all to strive for the highest and best." . . . "In physiology, especially, it is impossible to draw a dividing line between the theoretical and the practical. Knowledge of the behavior of the frog heart is of the utmost importance for the future physician, although he knows that the frog is a cold-blooded animal and that conditions are by no means the same in the frog and in man; also the reflexes in the cat's tail, although this knowledge cannot be applied directly to the tail-less *genus homo*. The best way to teach a science is to teach it as if one were specializing in this branch of science alone, and not be deterred by any dissatisfaction on the part of the pupils as to whether they can ever utilize later what they are studying. But for this the teacher must give only the general outlines, the fundamentals, omitting the finer details unless necessary to elucidate some point.

"Above all," he continues, "the practical courses should train in dexterity in the use of the hands. It should be demanded first and foremost of a physician that he should be handy. During the preclinical courses in particular he should be given opportunities to train his fingers in fine work. And nothing calls for better work in this line than making a preparation of a nerve with its ramifications, or a histologic preparation, a chemical analysis or a physiologic experiment. Such exercises serve another purpose also in that they show where the student has got an incomplete or incorrect grasp of a subject," . . . "Is it not deplorable," he adds "that it is possible for a medical student to obtain his degree without ever having put through, himself, a series of simple fundamental experiments and observations in any branch of the science?" . . . "Another argument in favor of the scientific in medical teaching is that it affords the opportunity to wake a slumbering love of science and stimulate the student to develop this unsuspected latent talent, and fit himself to be the leader and teacher of the morrow, carrying forward the torch of science when it would drop from others' hands. In short," he emphasizes, "we must constantly bear in mind that first-class professors and scientific training mean first-class professors and first-class physicians in the future."

70. **Epidemic Cerebrospinal Meningitis.**—Plat states that although this disease is extremely rare in the Netherlands, yet last year he had twenty-five cases in his service at 's-Gravenhage, mostly in soldiers. The disease was of a very severe type but the mortality for the total number was 50 per cent. He emphasizes that the outcome depends on getting the antiserum into the meninges in time, and he had the physician summoned by telephone the moment any one was brought in with symptoms suggesting meningitis. The physician hastened to the bedside at once, day or night, and lumbar puncture was done without a moment's delay. If the fluid looked suspicious or the clinical symptoms were decisive, the antiserum was injected at once. If not, he waited for bacteriologic findings from the fluid. When the fluid was under very low pressure—only one drop at a time escaping at four or five seconds' interval—it often took an hour or longer to withdraw the desired amount, but the benefit always justified the waiting; the idea of hastening the escape of fluid by aspiration he regards as too dangerous to consider for a moment.

Hospitalstidende, Copenhagen

August 30, LIX, No. 35, pp. 845-868

74 *Embolic or Thrombotic Obstruction of Mesenteric Vessels; Four Cases. (4 Tilfælde af Tarminfarkt.) A. Berntsen.—p. 845.

September 6, No. 36, pp. 869-892

75 *Prurigo Nodularis; Two Cases. N. Nander.—p. 869.

74. **Infarction of the Intestines.**—Berntsen compares the necropsy findings with the clinical course in cases of obstruction of a mesenteric artery or mesenteric vein in four men from 24 to 72 years old. In one case there had been contusion of the abdomen three weeks before. In another there was a history of abdominal pains at times for years and recent pulmonary trouble. Only the microscope revealed phlebitis and thrombosis in the small mesenteric veins. In the younger man the thrombosis was secondary to incarcerated inguinal hernia which had been reducible for fifteen years. The prognosis is bad, but operative treatment is always indicated. The onset of trouble may resemble that of ileus. With embolism it is sudden and stormy, with thrombosis more insidious. Bloody diarrhea is almost the only differentiating symptom; this may occur with invagination, but the latter is encountered almost exclusively in children. There is bloody diarrhea in only a small proportion of cases of intestinal infarction.

75. **Nodular Prurigo.**—The two patients whose cases are described were working men of 24 and 41. The affection began in the younger man seven months before, with intense itching on the feet and hands, and later of other parts of the body except the trunk. As he scratched the itching regions, bunches developed in the skin, and the slightest touch starts the nodules and bunches to itching. The young man seems to be normal otherwise except for the lymphangitis and ulcerating nodules that have been scratched and infected. The microscopic diagnosis of an excised tumor confirmed the assumption of a neurodermatitis. This also proved to be the trouble in the second case. This man of 41 had been under treatment for exophthalmic goiter about a year after the skin affection developed. In both cases the nodules retrogressed under salicylated salves and other local measures, and prevention of scratching, with bromid and valerian internally. Nander knows of only thirty-two similar cases on record. A nervous predisposition was manifest in most cases, but warm weather seems to attenuate the tendency to the affection.

Hygiea, Stockholm

LXXVIII, No. 16, pp. 1185-1278

76 *Fate of Patients with Cancers Deemed Inoperable. (En efterundersökning av på Serafimerlasarettets kirurgiska avdelning under åren 1907-1914 vårdade fall av "cancer ventriculi inoperabilis.") A. Troell.—p. 1185.

77 *Parinaud's Conjunctivitis. (Några ord med anledning av ett fall av "conjunctivitis Parinaud.") K. Stålberg.—p. 1209.

78 The Borderline Between Teratology and Tumors. (Från gransgebitet mellan missbildning och svulst.) C. Heijl.—p. 1215.

76. **What Becomes of Patients with "Inoperable Cancer"?**—Troell has traced to date all the patients with gastric cancers deemed inoperable at the Serafimer hospital at Stockholm, between 1907 and 1914. In 137 cases a palliative gastro-enterostomy was done, and merely an exploratory laparotomy in 134, while no intervention of any kind was attempted in 30. Among the 70 gastro-enterostomy cases traced to date, death followed in from one to thirty-five months in all but 3, but these 3 patients are still living after intervals of from six to eight years, and also 2 of the exploratory laparotomy cases, although the interval since has been over six years. The most surprising finding, however, was that 3 patients in the group of 30 unoperated cases are still living from over four to eight years since to date although conditions had been found apparently so grave that even a palliative operation had not been attempted. These 9 surviving cases are analyzed. The trouble was evidently an ulcer instead of a cancer in most. Symptoms at times since have indicated this. But the patients have been clinically healthy most of the time, and the stomach shows nothing pathologic now in the one case examined with roentgenoscopy. In another case, as also in a more recent one, pernicious anemia had been mistaken for gastric cancer. In one case the trouble proved to be abdominal tuberculosis or a syphilitic affection, to which the patient finally succumbed. In connection with this case Troell relates a recent case in which a man of 54 with stomach symptoms had a tumor which could be felt beneath the left costal arch. It was assumed to be an inoperable gastric cancer. Ascites developed and supposed metastases were palpated in the abdomen. The man was very thin but did not seem to have cancer cachexia, and a positive Wassermann reaction cleared up the diagnosis. The other gastro-enterostomy patients survived from one to thirty-five months. This average survival of seven and a half months after gastro-enterostomy is surpassed by the average survival of fifteen to twenty months in the 183 resection cases in Troell's service, 1888-1914. The primary mortality with resection was only 22 and 19 per cent., while it was 17 per cent. in the gastro-enterostomy cases. This surprisingly high mortality from this makeshift operation of gastro-enterostomy is another argument in favor of resection instead of gastro-enterostomy, even when the cancer is close to the limits of operability.

77. **Parinaud's Conjunctivitis.**—Stålberg reviews the literature on this affection and reports a case in a girl of 17. A tuberculous origin seemed probable, especially as erythema nodosum developed later. Probably various germs may induce this clinical picture. No treatment seems to do much good, but in future he intends to give Finsen radiotherapy a trial.

Norsk Magazin for Lægevidenskaben, Christiania

September, LXXVII, No. 9, pp. 1125-1252

79 *Treatment of Disease in Uterine Adnexa. (Om betændelser i uteri adnexa.) T. Hesselberg.—p. 1125.

80 Social Service in American Hospitals. (Socialt arbeide ved amerikanske hospitaler.) K. Motzfeldt.—p. 1160.

81 *Cancer in Norway Institutions. (Hvor mange av Norges kræftpatienter dør paa anstalt?) M. Søegaard.—p. 1169.

82 The Chemistry of Colloids and Immunology. M. von Krogh (Argentina).—p. 1177.

79. **Disease in the Uterine Adnexa.**—Hesselberg refers to pathologic processes of all kinds in the tubes and ovaries, the peritoneum of the small pelvis and the connective tissue around the uterus. It is often difficult to decide whether puerperal infection or gonorrhea was the primary cause. Other causes may be lack of cleanliness during the menstrual period, infection from preventive measures, or appendicitis. Pain is the main symptom, and it may occur with comparatively insignificant adhesions or cicatricial changes. A slightly retracted sacro-uterine ligament may cause severe pain, which is liable to be labeled neurasthenic. With an acute process, a relatively low pulse speaks for a subperitoneal parametritic process while a rapid pulse locates the process in the peritoneum as a rule. He discusses whether to operate or not, citing numerous authorities and analyzing his own experience in 59 cases. Patients with salpingo-oophoritic tumors or parametritic infiltration were kept in bed not only through the febrile stage and as long as there were pains but until there was no further retrogression of the tumors. The women were thus kept in the clinic for forty-five days on an average, the range being from three to eighty-seven days. Moist heat is applied until the temperature is normal and hot air after this from electric light bulbs, heating to 70 C., from half an hour to one hour daily. Adhesions were treated with massage unless they were so firm that a laparotomy was required for them. Parametritic adhesions are massaged with both hands, for several minutes at a time, and this is repeated a few times a week or oftener according to the sensitiveness of the patient. The uterus is grasped with the hand from without and worked to and fro between this hand and the fingers in the vagina while applying direct massage besides.

The results of these measures are regarded as highly satisfactory, but Hesselberg warns that massage does not remove a kink or obstruction preventing conception, as a rule. Adhesions holding the uterus in pronounced retrofixation may be broken up by massage, but the subjective disturbances are liable to return, compelling artificial fixation of the uterus later, so that a laparotomy at once is advisable with extreme retroflexion. He tried to correct conditions through an opening in the vagina in two cases, but could not obtain adequate access and the disturbances returned. Sixteen pages are devoted to tabulation of the details in the fifty-nine cases. The longest course required was in a case of criminal abortion with bilateral tube and ovary tumors. The genital findings were apparently normal when the young woman was dismissed after eighty days of bed rest and local electric light baths.

81. **Cancer Patients in Norway's Institutions.**—Søegaard makes a plea for more beds for cases of inoperable cancer in the various public and private institutions. He has compiled from all the public and private hospitals, asylums and other institutions the number of inmates dying in them from cancer during 1911. The total is only 289, while the mortality from cancer that year is known to have been 2,292. Only one eighth of incurable cancers thus get institutional care, while the figures for England show that one fourth have it there.

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83 Confirmation of Etiologic Importance of Bordet-Gengou Bacillus in Whooping Cough. (Fortsatte Undersøgelser over Kighoste.) I. Chievitz and A. H. Meyer.—p. 1443.

84 Cystic Dilatation of Lower End of Ureter in Woman. (Om cystisk Dilatation af Ureters vesikale Del.) S. Prior.—p. 1457.